

Ústav anorganickej chémie SAV



Správa o činnosti organizácie SAV za rok 2013

Bratislava
január 2014

Obsah Správy o činnosti organizácie SAV za rok 2013

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1. Základné údaje o organizácii

1.1. Kontaktné údaje

Názov: Ústav anorganickej chémie SAV

Riaditeľ: doc. Ing. Miroslav Boča, PhD.

Zástupca riaditeľa: doc. Ing. Miroslav Hnatko, PhD.

Vedecký tajomník: RNDr. Jana Madejová, DrSc.

Predseda vedeckej rady: RNDr. Peter Komadel, DrSc.

Členovia snemu SAV: doc. Ing. Miroslav Boča, PhD., prof. RNDr. Pavol Šajgalík, DrSc.

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Názvy a adresy detašovaných pracovísk:

- **Vitrum Laugaricio - Centrum kompetencie skla, spoločné pracovisko**
ÚACH SAV, TnU AD, RONA, a.s. a FCHPT STU
Študentská 2, 911 50 Trenčín

Vedúci detašovaných pracovísk:

- **Vitrum Laugaricio - Centrum kompetencie skla, spoločné pracovisko**
ÚACH SAV, TnU AD, RONA, a.s. a FCHPT STU
prof. Ing. Dušan Galusek, DrSc.

Typ organizácie: Rozpočtová od roku 1953

1.2. Údaje o zamestnancoch

Tabuľka 1a Počet a štruktúra zamestnancov

| Štruktúra zamestnancov | K | K | | K do 35 rokov | | F | P | T |
|-----------------------------------|----|----|----|---------------------|----|----|-------|-------|
| | | M | Ž | M | Ž | | | |
| Celkový počet zamestnancov | 90 | 47 | 43 | 13 | 15 | 83 | 69,91 | 54,27 |
| Vedeckí pracovníci | 53 | 38 | 15 | 10 | 4 | 46 | 37,42 | 37,42 |
| Odborní pracovníci VŠ | 23 | 7 | 16 | 3 | 11 | 23 | 18,96 | 11,85 |
| Odborní pracovníci ÚS | 12 | 2 | 10 | 0 | 0 | 12 | 11,53 | 5 |
| Ostatní pracovníci | 2 | 0 | 2 | 0 | 0 | 2 | 2 | 0 |

K – kmeňový stav zamestnancov v pracovnom pomere k 31.12.2013 (uvádzať zamestnancov v pracovnom pomere, vrátane riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí, v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)

F – fyzický stav zamestnancov k 31.12.2013 (bez riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí v

štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)

P – celoročný priemerný prepočítaný počet zamestnancov

T – celoročný priemerný prepočítaný počet riešiteľov projektov

M, Ž – muži, ženy

Tabuľka 1b Štruktúra vedeckých pracovníkov (kmeňový stav k 31.12.2013)

| Rodová skladba | Pracovníci s hodnosťou | | | | Vedeckí pracovníci v stupňoch | | |
|----------------|------------------------|-----------|-------|------|-------------------------------|------|------|
| | DrSc. | CSc./PhD. | prof. | doc. | I. | IIa. | IIb. |
| Muži | 7 | 32 | 4 | 9 | 7 | 16 | 15 |
| Ženy | 2 | 15 | 0 | 0 | 2 | 3 | 10 |

Tabuľka 1c Štruktúra pracovníkov podľa veku a rodu, ktorí sú riešiteľmi projektov

| Veková štruktúra (roky) | < 31 | 31-35 | 36-40 | 41-45 | 46-50 | 51-55 | 56-60 | 61-65 | > 65 |
|-------------------------|------|-------|-------|-------|-------|-------|-------|-------|------|
| Muži | 2 | 7 | 7 | 3 | 2 | 1 | 9 | 4 | 1 |
| Ženy | 5 | 4 | 6 | 3 | 2 | 1 | 3 | 3 | 1 |

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2013

| | Kmeňoví zamestnanci | Vedeckí pracovníci | Riešitelia projektov |
|--------------|---------------------|--------------------|----------------------|
| Muži | 45,8 | 44,8 | 46,7 |
| Ženy | 42,3 | 39,5 | 42,8 |
| Spolu | 44,1 | 43,3 | 45,0 |

1.3. Iné dôležité informácie k základným údajom o organizácii a zmeny za posledné obdobie (v zameraní, v organizačnej štruktúre a pod.)

Ústav v roku 2013 zaznamenal zmenu v pozícii riaditeľa, kedy od 4.6.2013 bol vedením ústavu poverený doc. Ing. Miroslav Boča, PhD., ktorý bol následne zvolený a menovaný do funkcie riaditeľa ústavu s účinnosťou od 1.9.2014 na dobu štyroch rokov. Dlhoročný riaditeľ prof. RNDr. Pavol Šajgalík, DrSc. bol zvolený do Predsedníctva Slovenskej akadémie vied a zastáva pozíciu podpredsedu SAV pre ekonomiku. V súvislosti s touto zmenou bol zástupcom riaditeľa menovaný doc. Ing. Miroslav Hnatko, PhD. Zmena nastala aj v zastúpení ústavu v Sneme SAV. Od 7.1.2013 nahradil prof. Šajgalíka doc. Boča, ktorý zastupuje ústav aj v aktuálnom funkčnom období snemu (od 23.4.2014 na dobu štyroch rokov).

Významným momentom pre ústav bolo menovanie doc. Ing. Galuseka, PhD. profesorom ako aj jeho úspešná obhajoba doktorskej práce a priznanie pozície vedúci vedecký pracovník.

Priemerný vek zamestnancov ÚACh SAV sa dlhodobo nemení a je pod hranicou 45 rokov. V roku 2013 je priemerný vek všetkých pracovníkov ústavu 44,1 roka a priemerný vek vedeckých pracovníkov je 43,3. I napriek tomu, že zamestnávanie mladých schopných postdocov na ústave je jednou z hlavných priorít, nevieme ju v primeranej požadovanej miere naplniť. Ak sa podarí nejakého mladého vedeckého pracovníka po skončení PhD štúdia zamestnať, tak len cez projekty, a to znamená, že na dobu 2-3 rokov, za tabuľkovú mzdu. Mnohí z mladých vedeckých pracovníkov takúto ponuku odmietnu. Z toho plynie aj pravdepodobné zvyšovanie priemerného veku zamestnancov, keďže počet pracovníkov v dôchodkovom veku je minimálny. Takáto situácia kladie nároky na personálnu a predovšetkým mzdovú politiku vedenia ústavu. Motivácia mladých

pracovníkov pre zotrvanie na ústave sa realizuje predovšetkým prostredníctvom poskytnutia možnosti zvyšovania ich kvalifikácie (stupeň IIb, IIa a Ia), je to jediný prostriedok pre zvyšovanie vedeckej výkonnosti organizácie. Zvyšovanie kvalifikácie vedeckých pracovníkov má logicky za následok zvýšený tlak na mzdový fond. Tento fakt by mohlo pri tvorbe rozpočtu, hlavne mzdových fondov ústavov, zohľadniť aj vedenie SAV pri presadzovaní vlastnej mzdovej politiky v rámci SAV, čo sa na II. oddelení vied SAV zatiaľ v obmedzenej forme realizuje.

Ústav sa výraznou mierou podieľa na realizácii projektov financovaných zo ŠF EÚ v pozícii hlavného partnera aj partnera. V roku 2013 bol riešiteľom 9 projektov, z toho 7 projektov pokračuje z predošlých rokov. Z toho plynie aj naliehavá potreba rozšírenia administratívy ústavu. Zvýšený počet pracovníkov ústavu v posledných rokoch je spojený najmä s nárastom počtu administratívnych pracovníkov manažujúcich projekty ŠF, pričom výraznú časť administratívnych výkonov preberajú aj vedeckí pracovníci. Prepočítaný počet pracovníkov vzrástol z 59,6 FTE v roku 2008 na 69,91 FTE v roku 2013. Tento nárast je hradený z prostriedkov projektov ŠF, avšak pri problematickom prísune prostriedkov z Agentúry Ministerstva školstva, vedy, výskumu a športu SR pre ŠF EÚ (ASFEU) vznikajú veľmi napäté situácie v mzdovom fonde ústavu, z ktorého si musíme „požičiavať“ na financovanie hlavne administratívnych pracovníkov. Tento komplikovaný proces prináša ďalšiu zbytočnú administratívnu záťaž. Navyše všetky neoprávnené výdavky na novoprijatých pracovníkov hradených zo ŠF znáša ústav, pričom tieto neoprávnené výdavky sú podľa nás agentúrou generované často neopodstatnené.

2. Vedecká činnosť

2.1. Domáce projekty

Tabuľka 2a Zoznam domácich projektov riešených v roku 2013

| ŠTRUKTÚRA PROJEKTOV | Počet projektov | | Čerpané financie za rok 2013 (v €) | | |
|---|-----------------|---|---------------------------------------|-------------------------|--------|
| | A | B | A | | B |
| | | | spolu | pre organi- záciu | |
| 1. Vedecké projekty, ktoré boli r. 2013 financované VEGA | 11 | 1 | 113650 | 113650 | 620 |
| 2. Projekty, ktoré boli r. 2013 financované APVV | 9 | 5 | 425036 | 305643 | 39503 |
| 3. Projekty OP ŠF | 1 | 8 | 477092 | 231492 | 373730 |
| 4. Projekty centier excelentnosti SAV | 0 | 1 | - | - | 4152 |
| 5. Iné projekty (FM EHP, ŠPVV, Vedecko-technické projekty, ESF, na objednávku rezortov a pod.) | 0 | 0 | - | - | - |

A - organizácia je nositeľom projektu

B - organizácia sa zmluvne podieľa na riešení projektu

2.2. Medzinárodné projekty**2.2.1. Medzinárodné projekty riešené v roku 2013**

Tabuľka 2b Zoznam medzinárodných projektov riešených v roku 2013

| ŠTRUKTÚRA PROJEKTOV | Počet projektov | | Čerpané financie za rok 2013 (v €) | | |
|---|-----------------|---|---------------------------------------|-------------------------|--------|
| | A | B | A | | B |
| | | | spolu | pre organi- záciu | |
| 1. Projekty 7. Rámcového programu EÚ | 0 | 2 | - | - | 178846 |
| 2. Multilaterálne projekty v rámci vedeckých programov COST, ERANET, INTAS, EUREKA, ESPRIT, PHARE, NATO, UNESCO, CERN, IAEA, ESF (European Science Foundation), ERDF a iné | 0 | 0 | - | - | - |
| 3. Projekty v rámci medzivládnych dohôd o vedecko-technickej spolupráci | 4 | 0 | - | - | - |
| 4. Bilaterálne projekty | 3 | 1 | 7660 | 7660 | - |
| 5. Podpora medzinárodnej spolupráce z národných zdrojov (MVTS, APVV,...) | 5 | 2 | 30612 | 30612 | 18287 |
| 6. Iné projekty financované alebo spolufinancované zo zahraničných zdrojov | 0 | 0 | - | - | - |

*A - organizácia je nositeľom projektu**B - organizácia sa zmluvne podieľa na riešení projektu*

2.3. Najvýznamnejšie výsledky vedeckej práce

2.3.1. Základný výskum

Názov: Jav molekulovej agregácie, jeho reakčný mechanizmus a spôsob potlačenia pri príprave fluorescenčných hybridných materiálov

Riešiteľský kolektív: *A. Czímerová, L. Jankovič, J. Madejová, A. Čeklovský, J. Bujdák*

Vývoj nových hybridných systémov pozostávajúcich z vrstevnatých anorganických nosičov a adsorbovaných fotoaktívnych molekúl je v súčasnosti veľmi aktuálnou témou z hľadiska perspektívy priemyselných aplikácií. Jedným z javov, ktorý sprevádza vznik hybridov ílových minerálov a laserových farbív je molekulová agregácia. Tento jav sa podrobne analyzoval pre koloidné hybridné systémy farbiva rodamínu 6G a montmorillonitu. Po prvýkrát sa využili chemometrické metódy pre analýzu absorpčných spektier týchto systémov. Podarila sa identifikácia mechanizmu vzniku a premeny jednotlivých foriem agregátov, vrátane parametrov chemickej kinetiky. Prínos práce môže mať širšie využitie pre všeobecné pochopenie podobných dejov prebiehajúcich v koloidných a heterogénnych systémoch.

Vznik molekuloých agregátov môže byť nežiadúcim javom pri príprave fotoaktívnych hybridných materiálov a spôsobiť stratu fotoaktivity interkalovaných molekúl farbív. V sústavách s laserovými farbivami sa molekulová agregácia prejavuje ako strata fluorescence. V minulosti sa tento problém podarilo eliminovať modifikáciou anorganického nosiča alkylamónnymi kationmi. Nový spôsob na potlačenie molekulovej agregácie farbív je založený na modifikácii montmorillonitu pomocou polykatiónu - poly(dialyldimetylamónium) chloridu. Pripravili sme sériu koloidných systémov rodamínu 6G a montmorillonitu s postupne rastúcim množstvom polykatiónu, čo sa významne odzrkadlilo na fluorescencii a dobe života excitovaných stavov. Hlavným prínosom je možnosť využitia modifikácie ílového minerálu pomocou polykatiónu na efektívne potláčanie nežiadúcej molekulovej agregácie farbív a tým dosiahnutie vyššej fotoaktivity farbív v hybridných materiáloch.

Publikácie:

A. Czímerová, L. Jankovič, J. Madejová, A. Čeklovský: Unique photoactive nanocomposites based on rhodamine 6G/Polymer/Montmorillonite hybrid systems. *Journal of Polymer Science: Part B: Polymer Physics* 51, 1672 – 1679, 2013

M. Lofaj, I. Valent, J. Bujdák: Mechanism of rhodamine 6G molecular aggregation in montmorillonite colloid. *Central European Journal of Chemistry*, 11, 1606 – 1619, 2013

Projekty:

APVV-0291-11: Fotoaktívne hybridné nanomateriály s luminiscenčnými a antimikrobiálnymi vlastnosťami

VEGA2/0107/13: Hybridné materiály vrstevnatých kremičitanov s kyanínovými a porfyrínovými farbivami

2.3.2. Aplikčný typ

Názov: Hlinitanové sklá s luminiscenčnými vlastnosťami

Riešiteľský kolektív: *D. Galusek, A. Prnová, R. Klement, J. Kraxner, K. Bodišová*

Hlinitanové sklá je možné z viacerých dôvodov považovať za ideálne substráty pre opticky aktívne dopanty. Sú transparentné v infračervenej, viditeľnej aj blízkej ultrafialovej oblasti spektra, a v porovnaní s kremičitanovými sklami sú pre ne charakteristické výrazne nižšie fonónové energie. Výsledkom sú menšie straty neradiačnými prechodmi a vyššia účinnosť emisie. V porovnaní s kryštalickými hlinitanmi majú podstatne vyššiu schopnosť absorbovať opticky aktívne dopanty a sú preto vhodné ako materiály pre úsporné osvetľovacie zdroje (napr. LED diódy s vysokou

svietivosťou, resp. substráty pre tuhé lasery). Príprava týchto skiel je však pomerne náročná, vzhľadom na ich vysoké taviace teploty blížiac sa k 2000 °C, a značný sklon ku kryštalizácii vyžadujúci pri ich príprave použitie vysokých chladiacich rýchlostí. V rámci projektu sme vyvinuli metódu prípravy takýchto skiel v systémoch $\text{Al}_2\text{O}_3\text{-RE}_2\text{O}_3\text{-(SiO}_2, \text{ZrO}_2)$, kde RE = Y, Yb, La, resp. $\text{Al}_2\text{O}_3\text{-CaO-SiO}_2$, dopovaných opticky aktívnymi prvkami (tzv. aktivátormi), ako sú Eu, Er, Nd, resp. prechodnými kovmi, ako sú V, Bi, Mn vo forme mikroguličiek plameňovou syntézou z práškových prekursorov. Podrobne sa preskúmal vzťah medzi zložením, štruktúrou a luminiscenčnými vlastnosťami vo viditeľnej a infračervenej oblasti spektra, pričom pozornosť sa sústredila najmä na skúmanie vplyvu kryštalizácie na vlnovú dĺžku a intenzitu emitovaného žiarenia. Sklá vykazujú, v závislosti od typu aktivátora, intenzívnu emisiu v červenej, resp. zelenej oblasti spektra, pričom vo viacerých prípadoch sa pozorovalo zvýšenie intenzity emisie, resp. väčšia šírka emisného pásu u sklenených materiálov v porovnaní s ich kryštalickými náprotivkami.

Publikácie:

1. A. Prnová, K. Bodišová, R. Klement, M. Migát, P. Veteška, M. Škrátek, E. Bruneel, I. Van Driessche, and D. Galusek, Preparation and characterization of $\text{Yb}_2\text{O}_3 - \text{Al}_2\text{O}_3$ glasses by the Pechini sol-gel method combined with flame synthesis, *Ceramics International*, 2014, v tlači
2. A. Domanická, R. Klement, A. Prnová, K. Bodišová, D. Galusek, Luminescent rare-earth doped $\text{Al}_2\text{O}_3\text{-Y}_2\text{O}_3\text{-SiO}_2$ glass microspheres prepared by flame synthesis, *Ceramic International*, 2014, v tlači

Projekt: SAS-NSC JRP 2012/14 “New rare earth-free inorganic phosphors for energy-saving lighting applications”

2.3.3. Medzinárodné vedecké projekty

Názov: Pokrok v teoretickom predpovedaní a interpretácii paramagnetických NMR spektier

Riešiteľský kolektív: V. Malkin, O.L. Malkina, A. Komorovský, M. Repiský

Paramagnetická nukleárna magnetická rezonancia (pNMR) je výkonná experimentálna metóda poskytujúca mimoriadne dôležité informácie vedúce k určeniu trojdimenzionálnej štruktúry chemických a biochemických molekúl (vrátane komplexných biologických látok v roztokoch). Interpretácia experimentálnych dát je zvyčajne založená na empirických vzťahoch a veľmi zjednodušených teoretických modeloch. Na zvýšenie presnosti určovania štruktúry je nutné použiť pokročilé kvantovochemické výpočty. Pretože študované zlúčeniny často obsahujú atómy ťažkých prechodných kovov alebo lantanoidov, teoretické výpočty musia zahŕňať relativistické efekty na priemeranej úrovni.

S týmto cieľom sme vyvinuli novú relativistickú metódu založenú na Diracovej-Kohnovej-Shamovej rovnici pre výpočty NMR konštánt tienenia paramagnetických dubletových systémov. Vyhodnotenie pNMR tenzorov sa redukuje na relativistický výpočet elektrónových g-tenzorov a NMR tenzorov tienenia. Skúšobné výpočty pre komplexy Ru(III) ukazujú dobrý výkon metódy pri reprodukovaní experimentálnych výsledkov a v aplikovateľnosti pre štúdium chemicky relevantných systémov strednej veľkosti.

Publikácia: S. Komorovský, M. Repiský, K. Ruud, O.L. Malkina, V.G. Malkin: Four-Component Relativistic Density Functional Theory Calculations of NMR Shielding Tensors for Paramagnetic Systems. *J. Phys. Chem. A* 117, 14209–14219, 2013.

Projekt: 7RP Európskej únie: Marie Curie Initial Training Networks action (FP7-PEOPLE-2012-ITN), project 317127 “pNMR”.

2.4. Publikačná činnosť (úplný zoznam je uvedený v Prílohe C)

Tabuľka 2c Štatistika vybraných kategórií publikácií

| PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ | A Počet v r. 2013/ doplňky z r. 2012 | B Počet v r. 2013/ doplňky z r. 2012 | C Počet v r. 2013/ doplňky z r. 2012 |
|--|---|---|---|
| 1. Vedecké monografie vydané v domácich vydavateľstvách (AAB, ABB, CAB) | 0 / 0 | 0 / 0 | 0 / 0 |
| 2. Vedecké monografie vydané v zahraničných vydavateľstvách (AAA, ABA, CAA) | 0 / 0 | 0 / 0 | 0 / 0 |
| 3. Odborné monografie, vysokoškolské učebnice a učebné texty vydané v domácich vydavateľstvách (BAB, ACB) | 0 / 0 | 0 / 0 | 0 / 0 |
| 4. Odborné monografie a vysokoškolské učebnice a učebné texty vydané v zahraničných vydavateľstvách (BAA, ACA) | 0 / 0 | 0 / 0 | 0 / 0 |
| 5. Kapitoly vo vedeckých monografiách vydaných v domácich vydavateľstvách (ABD, ACD) | 0 / 0 | 0 / 0 | 0 / 0 |
| 6. Kapitoly vo vedeckých monografiách vydaných v zahraničných vydavateľstvách (ABC, ACC) | 2 / 0 | 0 / 0 | 0 / 0 |
| 7. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v domácich vydavateľstvách (BBB, ACD) | 0 / 0 | 0 / 0 | 0 / 0 |
| 8. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v zahraničných vydavateľstvách (BBA, ACC) | 0 / 0 | 0 / 0 | 0 / 0 |
| 9. Vedecké a odborné práce v časopisoch evidovaných v Current Contents (ADC, ADCA, ADCB, ADD, ADDA, ADDB, CDC, CDCA, CDCB, CDD, CDDA, CDDB, BDC, BDCA, BDCB, BDD, BDDA, Bddb) | 59 / 2 | 0 / 0 | 0 / 0 |
| 10. Vedecké a odborné práce v nekarentovaných časopisoch (ADE, ADEA, ADEB, ADF, ADFA, ADFB, CDE, CDEA, CDEB, CDF, CDFA, CDFB, BDE, BDEA, BDEB, BDF, BDFA, BDFB) | 4 / 9 | 0 / 0 | 0 / 0 |
| 11. Vedecké a odborné práce v zborníkoch (konferenčných aj nekonferenčných, vydaných tlačou alebo na CD) | | | |
| a/ recenzovaných, editované (AEC, AED, AFA, AFB, AFBA, AFBB, BEC, BED, CEC, CED) | 17 / 1 | 0 / 0 | 0 / 0 |
| b/ nerecenzovaných (AEE, AEF, AFC, AFD, AFDA, AFDB, BEE, BEF) | 11 / 0 | 0 / 0 | 0 / 0 |

| | | | |
|---|--------------|--------------|--------------|
| 12. Vydané periodiká evidované v Current Contents | 0 | 0 | 0 |
| 13. Ostatné vydané periodiká | 0 | 0 | 0 |
| 14. Vydané alebo editované zborníky z vedeckých podujatí (FAI) | 1/0 | 0/0 | 0/0 |
| 15. Vedecké práce uverejnené na internete (GHG) | 0 / 0 | 0 / 0 | 0 / 0 |
| 16. Preklady vedeckých a odborných textov (EAJ) | 0 / 0 | 0 / 0 | 0 / 0 |
| 17. Heslá v odborných terminologických slovníkoch a encyklopédiách vydaných * (BDA, BDB) | 0 / 0 | 0 / 0 | 0 / 0 |

A - pracovisko SAV je uvedené ako pracovisko (adresa) autora, alebo je súčasťou kolaborácie alebo iného združenia, ktoré je uvedené ako pracovisko (adresa) autora

B - pracovisko SAV nie je na publikácii uvedené, pretože prameň údaj o pracovisku autora neobsahuje, práca ale vznikla na pracovisku SAV

C - pracovisko SAV je uvedené ako materské pracovisko autora odlišné od pracoviska, na ktorom práca vznikla (napr. „on leave...“, „permanent address...“, „present address...“)

* - uvádzajú sa len heslá, pri ktorých je uvedený autor a ich rozsah je min. 1 autorský hárok

Tabuľka 2d Ohlasy

| OHLASY | A Počet v r. 2012/ doplňky z r. 2011 | B Počet v r. 2012/ doplňky z r. 2011 |
|--|---|---|
| Citácie vo WOS (1.1, 2.1) | 1322 / 7 | 18 / 0 |
| Citácie v SCOPUS (1.2, 2.2) | 100 / 6 | 1 / 0 |
| Citácie v iných citačných indexoch a databázach (9, 10) | 0 / 0 | 0 / 0 |
| Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4) | 2 / 0 | 0 / 0 |
| Recenzie na práce autorov z organizácie (5, 6, 7, 8) | 0 / 0 | 0 / 0 |

A - pracovisko SAV je uvedené ako pracovisko (adresa) autora, alebo je súčasťou kolaborácie alebo iného združenia, ktoré je uvedené ako pracovisko (adresa) autora, alebo pracovisko SAV nie je na publikácii uvedené, pretože prameň údaj o pracovisku autora neobsahuje, práca ale vznikla na pracovisku SAV

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2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2e Vedecké podujatia

| | |
|--|-----|
| Prednášky a vývesky na medzinárodných vedeckých podujatiach | 123 |
| Prednášky a vývesky na domácich vedeckých podujatiach | 17 |

2.6. Vyžiadané prednášky

2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

T. Bučko, S. Lebegue, J. Hafner, J. G. Angyan: *Improved density dependent correction for the description of London dispersion interactions*, 5th JCS International Symposium on Theoretical Chemistry, 2. – 5. 12. 2013

A. Czímerová: *Traditional and novel methods for the characterization of the layer charge of clay*

- minerals*, 2nd International Conference Clays, Clay Minerals and Layered Materials, St. Petersburg State University, Faculty of Geology, St. Petersburg, Rusko, 08.09.2013 – 11.09.2013
- M. Hrdá:** *Implementation of diagonalization-free algorithm in ReSpec at one- and four-component level*, CESTC 2013 Central European Symposium on Theoretical Chemistry, Znojmo, Česká republika, 22. – 25. 09. 2013
- P. Komadel,** M. Pentrák, J. Madejová, V. Hronský, P. Uhlík: *Smectites in contact with acids*. 2nd International Conference "Clays, Clay Minerals and Layered Materials", 11.-15. 9. Saint Petersburg, Russia, 2013.
- Z. Lenčes,** M. Hrabalová, I. Ibrahim, L. Benco, P. Šajgalík: *Europium and cerium-doped MgSiN₂ and LaSi₃N₅ – electronic structure and luminescent properties*, 13th International Conference of the European Ceramic Society, Limoges, Francúzsko, 21. – 27. 6. 2013
- Z. Lenčes,** L. Benco, M. Hrabalová, I. Ibrahim, P. Šajgalík: *Functionalization of silicon nitride/oxy-nitride-based engineering ceramics*, Spring Meeting of the European Materials Research Society (E-MRS), Strasbourg, Francúzsko, 27. – 29. 2013
- Z. Lenčes,** P. Šajgalík, M. Hnatko, M. Gall, P. Tatarko, Z. Chlup: *Grain boundary chemistry of silicon nitride based nano composites – Implications to mechanical, tribological and chemical properties*, Innovative Manufacturing Technology (IMT 2013), Krakow, Poľsko, 18. – 20. 11. 2013
- Z. Lenčes,** M. Hrabalová, I. Ibrahim, L. Benco, P. Šajgalík: *Influence of Eu, Ce and Sm Dopants on the Electronic Structure and Photoluminescence of MgSiN₂ and LaSi₃N₅-Based Phosphors*, 4th International Symposium on Advanced Ceramics and Technology (ACTSEA 2013) Taipei, Taiwan, 09. – 15. 11. 2013
- M. Liška,** M. Chromčíková, H. Kaňková, P. Vlčková, K. Faturíková, V. Soltesz: *Kinetics and thermodynamics of glass fibrous insulation corrosion by the coolant solution – building a kinetic model from experimental data*, 23rd International Congress on Glass, Praha, Česká Republika, 24. – 25. 9. 2013
- M. Liška,** M. Chromčíková, J. Macháček: *Glass structure and thermodynamic models*, International Days of Materials Science, Pardubice, Česká republika, 24. – 25. 9. 2013
- J. Madejová:** *Near-IR spectroscopy in the organo-clays studies*, Nano Ostrava 2013, 17. – 20. 6. 2013
- J. Madejová:** *InfraRed spectroscopy: Theory and clay minerals applications*, Second Russian School by Clay Minerals-Argilla studium 2013, St. Petersburg, Rusko, 8 – 11. 9. 2013
- O. Malkin,** A. Křístková: *Relativistic 4-component calculations of indirect nuclear spin-spin couplings. To fit, or not to fit: that is the question*, deMon developers meeting, Toulouse, Francúzsko, 24. – 27. 6. 2013
- A. Křístková, S. Komorovsky, M. Repisky, V. Malkin, **O. Malkin:** *Recent progress in relativistic four-component calculations in NMR indirect nuclear spin-spin coupling constants*, the 5th Japanese-Czech-Slovak International Symposium on Theoretical Chemistry, Nara, Japonsko, 2. – 6. 12. 2013
- V. Malkin:** *Relativistic calculations of NMR and EPR parameters: current situation and outlook*, pNMR kick-off meeting (v rámci medzinárodného projektu: pNMR FP7-PEOPLE-2012-ITN), Lyon, Francúzsko, 10. – 11. 2. 2013
- V. Malkin:** *Fully relativistic calculations of EPR and NMR parameters: do we understand what we are doing?*, deMon developers meeting, Toulouse, Francúzsko, 24. – 27. 6. 2013
- V. Malkin:** *Fully relativistic calculations of pNMR parameters: development, interpretation and applications*, pNMR konferencia (v rámci medzinárodného projektu: pNMR FP7-PEOPLE-2012-ITN), Chamonix, Francúzsko, 6. – 8. 9. 2013
- V. Malkin:** *Four-Component Relativistic Density Functional Theory Calculations of NMR Shielding Tensors for Paramagnetic Systems*, The 5th Japanese-Czech-Slovak International Symposium on Theoretical Chemistry, Nara, Japonsko, 2. – 6. 12. 2013.
- J. Noga:** *Ab initio theory in a nutshell*, Molecular processes for astrochemistry, COST 'The Chemical Cosmos' training school, 2 x 60 min., Grenoble, Francúzsko, 18. – 22. 3. 2013
- J. Noga:** *From XCC to XGCC*, 7th Molecular Quantum Mechanics, International Conference on

Electron Correlation: The Many-Body Problem at the Heart of Chemistry, Palazzo dei Congressi, Lugano, Švajčiarsko, 2. – 7. 6. 2013

J. Noga: *Expectation value coupled cluster approach using the ansatz with generalized double-substitutions cluster operator*, The VIIIth Congress of the International Society of Theoretical Chemical Physics, Budapešť, Maďarsko, 25. – 30. 8. 2013

O. Demel, S. Kedžuch, **J. Noga**, J. Pittner: *State specific explicitly correlated multi-reference coupled cluster method including perturbative triple-excitations correction*, 9th European Conference of Computational Chemistry, Sopron, Maďarsko, 1. – 5. 9. 2013

P. Šajgalík, Z. Lenčoš, M. Hnatko, T. Plachký, R. Riedel: *Functionalization of nitride engineering ceramics by polymer derived sintering aids*, 37th International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach USA, 29. 1. 2013

P. Šajgalík, Z. Lenčoš, M. Hnatko, T. Plachký, R. Riedel: *Functionalization of nitride engineering ceramics by polymer derived sintering aids*, PacRim10, SanDiego, USA, 2. – 7. 6. 2013

P. Šajgalík, Z. Lenčoš, F. Frajkorová: *Easy machinable SiC ceramics*, PacRim10, SanDiego, USA, 2. - 7. 6. 2013

P. Šajgalík: *SiC/Si₃N₄ nano/micro-composites – phase and chemical composition - their implications to the RT and HT mechanical properties*, 13th International Conference of the European Ceramic Society, Limoges Francúzsko, 23. – 27. 6. 2013

P. Šajgalík: *SiC/Si₃N₄ nano/micro-composites – phase and chemical composition - their implications to the RT and HT mechanical properties*, International Conference of the Polish Ceramic Society, Zakopane, Poľsko, 19. – 22. 9. 2013

P. Šajgalík, Z. Lenčoš, M. Micháľková, Y. Zhou, K. Hirao: *Ternary Silicon Nitrides - from Engineering to Phosphors*, ACTSEA2013 Taipei, Taiwan, 11. 11. 2013

P. Šajgalík: *GB chemistry of silicon nitride based nano-composites – implications to mechanical, tribological and chemical properties*, 5th ISAC and 3rd ASPT, Wuhan, Čína, 11. 12. 2013

O. Hanzel, Z. Lenčoš, J. Sedláček, M. Hnatko, Š. Kavecký, **P. Šajgalík:** *Processing and properties of Al₂O₃-CNT and SiC-CNT nanocomposites*, 6th International Conference on Nanoscience, Nanotechnologies, Nanomaterials and NANO INFO DAY of the Nanoforce Project - NANOVED, Svit, 22. – 25. 9. 2013

2.6.2. Vyžiadané prednášky na domácich vedeckých podujatiach

J. Bujdák: *Fotosenzibilizačné materiály pre aktiváciu kyslíka, podstata antimikrobiálneho účinku a perspektíva aplikácií*, Čo nového v mikrobiológii, Konferencia Mladých mikrobiológov, Jasná, 21. – 24. marec 2013,

J. Bujdák: *Informácia o Medzinárodnej chemickej olympiáde, ktorá sa konala v r. 2012 vo Washingtone D.C., USA*, Celoštátne kolo 49. ročníka Chemickej olympiády (organizátor IUVENTA), Bratislava, 25. 2. 2013

M. Drábik: *Simultánna termická analýza, termoanalytické charakteristiky, a stechiometria termických rozkladov anorganických zlúčenín a materiálov*, Seminár T. A. Instruments, FÚ SAV, Bratislava, 19. 9. 2013

2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

Ak boli príspevky publikované, sú súčasťou Prílohy C, kategória (AFC, AFD, AFE, AFF, AFG, AFH)

M. Drábik: *Macro defect free (MDF) materials; the contribution of joint efforts and results of groups in Bratislava and Guildford in this field*, University of Surrey, Guildford, U.K., 21. 3. 2013

M. Drábik: *Macro defect free (MDF) materials; review on the recent developments*, Istanbul Technical University, Istanbul, Turecko, 9. 8. 2013

D. Galusek, R. Klement, A. Prnová, *Aluminate Luminescent Glasses*, National Taiwan University of Science and Technology, Taipei, Taiwan, 9. 11. 2013

P. Komadel: Smectites in contact with acids, Department of Geology, University of Georgia in Athens, GA, USA, 10. 1. 2013

M. Korenko: *Density, viscosity and electrical conductivity of the molten cryolite electrolytes (Na₃AlF₆-SiO₂) for solar grade silicon (Si-SoG) electrowinning*, Northeastern University (NEU), Shenyang, Čína, 21. 10. 2013

Z. Lenčoš: *Processing and properties of Al₂O₃-CNT and SiC-CNT nanocomposites*, *Modulární inovace bakalářských a navazujících magisterských programů*, Fakulta metalurgie a materiálového inženýrství, VŠB-TU Ostrava, 27. 11. 2013

O. Malkin: *Recent progress in interpretation of NMR and EPR parameters*, NIOCH SB RAS, Novosibirsk, Rusko, 16. 7. 2013

O. Malkin: *Recent progress in interpretation of NMR and EPR parameters*,

- Okazaki University, Okazaki, Japonsko, 18. 11. 2013
- Nagoya University, Nagoya, Japonsko, 20. 11. 2013
- Waseda University, Tokyo, Japonsko, 22. 11. 2013
- Metropolitan University, Tokyo, Japonsko, 25. 11. 2013
- Sendai University, Sendai, Japonsko, 29. 11. 2013

V. Malkin: *Relativistic calculations of NMR and EPR parameters: do we understand what we are doing?* NIOCH SB RAS, Novosibirsk, Rusko, 16. 7. 2013

V. Malkin: *Relativistic calculations of NMR and EPR parameters*,

- Fukui Institute, Kyoto, Japonsko, 15. 11. 2013
- Okazaki University, Okazaki, Japonsko, 18. 11. 2013
- Nagoya University, Nagoya, Japonsko, 20. 11. 2013
- Waseda University, Tokyo, Japonsko, 22. 11. 2013
- Metropolitan University, Tokyo, Japonsko, 25. 11. 2013
- Sendai University, Sendai, Japonsko, 29. 11. 2013

V. Malkin: *Is there a natural gauge origin for a spherical atom?* Metropolitan University, Tokyo, Japonsko, 26. 11. 2013

A. Prnová, D. Galusek, R. Klement, K. Bodišová, M. Micháľková, V. Pavlík, *Study of kinetics crystallization and luminiscence properties of Er and Nd doped yttrium aluminate and aluminosilicate glasses*, Department of Inorganic and Physical Chemistry WE06V, University of Ghent, Ghent, Belgicko, 16. 12. 2013

2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2013

2.7.1. Vynálezy, na ktoré bol udelený patent

V zahraničí - počet patentov: 1

Číslo PV: 1351

Mená autorov: Lenčoš Zoltán, Šajgalík Pavol, Harmuth Harald, Gschiel Sabine

Názov vynálezu: Vedahren zur Herstellungeines feuerfesten Werkstoffes auf Basis von Magnesia oder Magnesia-Spinell sowie ein feuerfester Werkstoff auf Basis von Magnesia oder Magnesia-Spinell

Majiteľ / spolumajiteľ: RefractoryIntellectualProperty GmbH & Co. KG

Krajina: Rakúsko

2.7.2. Prihlásené vynálezy

2.7.3. Predané licencie

2.7.4. Realizované patenty

Finančný prínos pre organizáciu SAV v roku 2013 a súčet za predošlé roky sa neuvádzajú, ak je zverejnenie v rozpore so zmluvou súvisiacou s realizáciou patentu.

2.8. Účasť expertov na hodnotení národných projektov (APVV, VEGA a iných)

Tabuľka 2f Experti hodnotiaci národné projekty

| Meno pracovníka | Typ programu/projektu/výzvy | Počet hodnotených projektov |
|-----------------|-----------------------------|-----------------------------|
| Drábik Milan | APVV | 1 |
| | VEGA | 2 |
| Galusek Dušan | APVV, VV2013 | 1 |
| | VEGA | 2 |
| Hnatko Miroslav | VEGA | 2 |
| Komadel Peter | VEGA | 3 |
| Lenčes Zoltán | VEGA | 6 |
| Noga Jozef | APVV | 2 |
| | VEGA | 2 |

2.9. Iné informácie k vedeckej činnosti

Počet karentovaných publikácií a kapitol v monografiách v tomto roku dosiahol číslo 61 CC + 2 kapitoly = 63, čo pri počte 37,42 vedeckých pracovníkov (prepočítaný stav, podľa Tabuľky 1a) znamená 1,68 karentovanej publikácie na vedeckého pracovníka. Aj keď tento parameter oproti vlaňajšku mierne stúpol (vlani 1,47), stav nepovažujeme za uspokojivý. Cieľom naďalej ostáva dosiahnuť dve publikácie na vedeckého pracovníka ročne, ktorý zodpovedá štandardu vyspelých vedeckých pracovísk s podobným zameraním. Priemerný impakt faktor časopisov, v ktorých boli práce uverejnené, bol 2,25, kým vlani bol 2,14. Citovanosť (vo všetkých dostupných databázach WOK – 1329, SCOPUS – 106) na vedeckého pracovníka (prepočítaný stav) je 32,9 citácie. Potešiteľný je trvalý trend rastu počtu citácií a ich prepočtu na vedeckého pracovníka a ich získavanie pracovníkmi všetkých oddelení ústavu.

Relatívne vysoké renomé vo svetovej vedeckej komunite dokumentuje aj vysoký počet vyžiadaných prednášok pracovníkov ústavu na medzinárodných vedeckých podujatiach, ktorých bolo 29, viaceré z nich odznali na veľmi významných svetových konferenciách, ďalších 20 prednášok bolo prednesených na zahraničných pracoviskách.

Ústav anorganickej chémie má rozsiahle skúsenosti s realizáciou projektov financovaných zo ŠF EÚ v pozícii hlavného partnera aj partnera. V roku 2013 bol riešiteľom 9 projektov, z toho 7 projektov pokračuje z predošlých rokov. Dva nové projekty sú "Univerzitný vedecký park STU Bratislava" s prijímateľom Slovenskou technickou univerzitou a "Centrum aplikovaného výskumu nových materiálov a transferu technológií" s prijímateľom Slovenskou akadémiou vied. Objem finančných prostriedkov alokovaných pre ústav zo všetkých realizovaných projektov predstavuje takmer 6,2 mil. €.

Koncom roka 2013 začal ústav spolupracovať s prijímateľom DEKONTA, s.r.o. a nahradil tak partnera 1 Výskumný ústav vodného hospodárstva v Bratislave v rámci projektu "Aplikovaný výskum a overenie technológií katalytickej dehalogenácie kontaminovaných vôd z priemyselných ekologických záťaží na reaktívnych bariérach", ktorý bol schválený vo výzve s kódom OPVaV-2011/4.2/07-SORO. Realizácia projektu začne v roku 2014.

Ústav sa v roku 2013 zapojil do ďalších zverejnených výziev, ktoré by mohli zvýšiť rozpočet

približne o 2 mil. € - vo výzve OPVaV-2013/4.1/04-SORO v projekte "Dezaktivácia heterogénnych katalyzátorov - vybudovanie excelentného výskumného centra" a vo výzve OPVaV-2013/2.2/09-RO v projekte "Výskumné centrum ALLEGRO". V prípade schválenia projektov sa očakáva začiatok ich implementácie od apríla 2014.

3. Doktorandské štúdium, iná pedagogická činnosť a budovanie ľudských zdrojov pre vedu a techniku

3.1. Údaje o doktorandskom štúdiu

Tabuľka 3a Počet doktorandov v roku 2013

| Forma | Počet k 31.12.2013 | | | | Počet ukončených doktorantúr v r. 2013 | | | | | |
|--------------------------------|--------------------|---|--------------------|---|--|---|---------------------|---|---------------------|---|
| | Doktorandi | | | | Ukončenie z dôvodov | | | | | |
| | celkový počet | | z toho novoprijatí | | ukončenie úspešnou obhajobou | | predčasné ukončenie | | neúspešné ukončenie | |
| | M | Ž | M | Ž | M | Ž | M | Ž | M | Ž |
| Interná zo zdrojov SAV | 9 | 4 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Interná z iných zdrojov | 2 | 3 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| Externá | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spolu | 11 | 8 | 4 | 1 | 2 | 3 | 0 | 0 | 0 | 0 |
| Súhrn | 19 | | 5 | | 5 | | 0 | | 0 | |

3.2. Zmena formy doktorandského štúdia

Tabuľka 3b Počty preradení

| Z formy | Interná z prostriedkov SAV | Interná z prostriedkov SAV | Interná z iných zdrojov | Interná z iných zdrojov | Externá | Externá |
|-----------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------|-----------------------------------|--------------------------------|
| Do formy | Interná z iných zdrojov | Externá | Interná z prostriedkov SAV | Externá | Interná z prostriedkov SAV | Interná z iných zdrojov |
| Počet | | | | | | |

3.3. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou

Tabuľka 3c Menný zoznam ukončených doktorandov v roku 2013 úspešnou obhajobou

| Meno doktoranda | Forma DŠ | Mesiac, rok nástupu na DŠ | Mesiac, rok obhajoby | Číslo a názov študijného odboru | Meno a organizácia školiteľa | Fakulta udeľujúca vedeckú hodnotu |
|-----------------------------------|--|---------------------------|----------------------|--|---|--|
| Ing. Peter Barborík | interné štúdium hrazené z iných zdrojov | 9 / 2009 | 8 / 2013 | 5.2.19 anorganická technológia a materiály | doc. Ing. Miroslav Boča PhD., Ústav anorganickej chémie SAV | Fakulta chemickej a potravinárskej technológie STU |
| Ing. Evelyn Andrea Bolaños Castro | interné štúdium hrazené z iných zdrojov | 9 / 2009 | 2 / 2013 | | Prof. Zdeněk Jonšta, | Vysoká škola báňská - TU Ostrava, Česká republika |
| Mgr. Anna Brtáňová | interné štúdium hrazené z prostriedkov SAV | 9 / 2009 | 8 / 2013 | 4.1.15 anorganická chémia | RNDr. Peter Komadel DrSc., Ústav anorganickej chémie SAV | Prírodovedecká fakulta UK |
| Mgr. Anežka Křístková | interné štúdium hrazené z iných zdrojov | 9 / 2009 | 8 / 2013 | 4.1.11 chemická fyzika | Dr. Olga Malkin DrSc., Ústav anorganickej chémie SAV | Prírodovedecká fakulta UK |
| Ing. Martin Michálek | interné štúdium hrazené z prostriedkov SAV | 9 / 2009 | 8 / 2013 | 5.2.19 anorganická technológia a materiály | prof. Ing. Dušan Galusek DrSc., Ústav anorganickej chémie SAV | Fakulta chemickej a potravinárskej technológie STU |

Zoznam interných a externých doktorandov je uvedený v Prílohe A.

3.4. Zoznam akreditovaných študijných programov s uvedením VŠ

Tabuľka 3d Zoznam akreditovaných študijných programov s uvedením univerzity/vysokej školy a fakulty

| Názov študijného programu (ŠP) | Názov študijného odboru (ŠO) | Číslo ŠO | Univerzita/vysoká škola a fakulta |
|--------------------------------|-------------------------------------|----------|--|
| | chemická fyzika | 4.1.11 | Prírodovedecká fakulta UK |
| | anorganická chémia | 4.1.15 | Prírodovedecká fakulta UK |
| | anorganická technológia a materiály | 5.2.19 | Fakulta chemickej a potravinárskej technológie STU |

Tabuľka 3e Účasť na pedagogickom procese

| Menný prehľad pracovníkov, ktorí boli menovaní do odborových komisií študijných programov doktorandského štúdia | Menný prehľad pracovníkov, ktorí pôsobili ako členovia vedeckých rád univerzít, správnych rád univerzít a fakúlt | Menný prehľad pracovníkov, ktorí získali vyššiu vedeckú, pedagogickú hodnosť alebo vyšší kvalifikačný stupeň |
|--|---|---|
| doc. Ing. Miroslav Boča, PhD. (anorganická chémia) | prof. Ing. Dušan Galusek, DrSc. (Trenčianska univerzita Alexandra Dubčeka v Trenčíne) | Ing. Michal Korenko, PhD. (IIa) |
| doc. Ing. Miroslav Boča, PhD. (anorganická technológia a materiály) | prof. Ing. Marek Liška, DrSc. (Fakulta chemická, Vysoké učení technické v Brně, VUT Brno, Česko) | doc. RNDr. Juraj Bujdák, DrSc. (doc., Prírodovedecká fakulta UK) |
| doc. RNDr. Juraj Bujdák, DrSc. (anorganická chémia) | prof. Ing. Marek Liška, DrSc. (Fakulta chemické technologie VŠCHT, Praha, ČR) | prof. Ing. Dušan Galusek, DrSc. (prof., Fakulta chemickej a potravinárskej technológie STU) |
| doc. RNDr. Milan Drábik, CSc. (anorganická chémia) | prof. Ing. Marek Liška, DrSc. (Fakulta priemyselných technológií TnUAD v Púchove) | prof. Ing. Dušan Galusek, DrSc. (DrSc., Slovenská Akadémia Vied) |
| prof. Ing. Dušan Galusek, DrSc. (anorganická technológia a materiály) | prof. Ing. Marek Liška, DrSc. (Trenčianska univerzita Alexandra Dubčeka v Trenčíne) | |
| doc. Ing. Miroslav Hnatko, PhD. (anorganická technológia a materiály) | prof. RNDr. Jozef Noga, DrSc. (Prírodovedecká fakulta UK) | |
| RNDr. Peter Komadel, DrSc. (anorganická chémia) | prof. RNDr. Pavol Šajgalík, DrSc. (Fakulta metalurgie a materiálového inžinierství, Vysoká škola báňská TU) | |
| doc. Ing. Zoltán Lenčes, PhD. (anorganická technológia a materiály) | prof. RNDr. Pavol Šajgalík, DrSc. (Hutnícka fakulta TUKE) | |
| doc. Ing. Zoltán Lenčes, PhD. (anorganická chémia) | prof. RNDr. Pavol Šajgalík, DrSc. (Slovenská technická univerzita v Bratislave) | |
| doc. Ing. Zoltán Lenčes, PhD. (odbor v zahraničí) | prof. RNDr. Pavol Šajgalík, DrSc. (Trenčianska univerzita Alexandra Dubčeka v Trenčíne) | |
| prof. Ing. Marek Liška, DrSc. (anorganická technológia a materiály) | prof. RNDr. Pavol Šajgalík, DrSc. (Vysoké učení technické, Brno) | |
| prof. Ing. Marek Liška, DrSc. (fyzika kondenzovaných látok a akustika) | | |
| prof. Ing. Marek Liška, DrSc. (odbor v zahraničí) | | |
| RNDr. Jana Madejová, DrSc. (anorganická technológia a | | |

| | | |
|---|--|--|
| materiály) | | |
| prof. RNDr. Jozef Noga, DrSc. (chemická fyzika) | | |
| prof. RNDr. Jozef Noga, DrSc. (anorganická chémia) | | |
| prof. RNDr. Jozef Noga, DrSc. (fyzika plazmy) | | |
| prof. RNDr. Pavol Šajgalík, DrSc. (anorganická technológia a materiály) | | |

3.5. Údaje o pedagogickej činnosti

Tabuľka 3f Prednášky a cvičenia vedené v roku 2013

| PEDAGOGICKÁ ČINNOSŤ | Prednášky | | Cvičenia a semináre | |
|--|-----------|-------------|---------------------|-------------|
| | doma | v zahraničí | doma | v zahraničí |
| Počet prednášateľov alebo vedúcich cvičení | 3 | 3 | 12 | 1 |
| Celkový počet hodín v r. 2013 | 58 | 24 | 798 | 108 |

Prehľad prednášateľov predmetov a vedúcich cvičení, s uvedením názvu predmetu, úväzku, katedry, fakulty, univerzity/vysokej školy je uvedený v Prílohe D.

Tabuľka 3g Aktivity pracovníkov na VŠ

| | | |
|----|---|----|
| 1. | Počet pracovníkov, ktorí pôsobili ako vedúci alebo konzultanti diplomových a bakalárskych prác | 6 |
| 2. | Počet vedených alebo konzultovaných diplomových a bakalárskych prác | 6 |
| 3. | Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.) | 11 |
| 4. | Počet školených doktorandov (aj pre iné inštitúcie) | 36 |
| 5. | Počet oponovaných dizertačných a habilitačných prác | 16 |
| 6. | Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce | 11 |
| 7. | Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác | 2 |
| 8. | Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD. prác | 11 |
| 9. | Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti v inauguračnom alebo habilitačnom konaní na vysokých školách | 3 |

3.6. Iné dôležité informácie k pedagogickej činnosti

ÚACH SAV vypísal pre akademický rok 2013/2014 celkovo 10 tém pre doktorandské štúdium v troch rôznych študijných odboroch: 4.1.15 Anorganická chémia, 5.2.19 Anorganické technológie a materiály a 4.1.11 Chemická fyzika. Na akademický rok 2013/2014 boli prijatí štyria noví študenti

(Mgr. Lukáš Petra na študijný odbor 4.1.15, Mgr. Márius Kádek a MA. Peter Cherry na študijný odbor 4.1.11, Ing. Katarína Müllerová, na študijný odbor 5.2.19).

PhD študenti na ÚACH SAV sa pravidelne zúčastňujú na študentských vedeckých podujatiach a konferenciách, akými sú ŠVK 2013 Bratislava.

Dôležitou súčasťou pedagogického procesu na ÚACH SAV je aj organizovanie odbornej praxe pre študentov 4. a 5. ročníka (PriF UK v Bratislave v spolupráci s prof. G. Pleschom). V roku 2013 sa praxe zúčastnili štyria študenti.

Dňa 19. septembra 2013 sa na ÚACH SAV konala SÚŤAŽ MLADÝCH VEDECKÝCH PRACOVNÍKOV. Súťaže sa zúčastnilo 13 mladých pracovníkov do 35 rokov z viacerých inštitúcií (ÚACH SAV, TnU AD Trenčín, FCHPT STU). Ich prezentácie posudzovala šesťčlenná komisia, ktorej predsedom bol RNDr. Peter Komadel, DrSc. Výsledky súťaže:

1. miesto: Ing. Ondrej Hanzel (ÚACH SAV)

2. miesto: MSc. Ibrahim Ismail (ÚACH SAV)

Ing. Hanzel reprezentoval ústav na medzinárodnom kole tejto súťaže, tentokrát na ÚACH ČAV v Řeži u Prahy, na ktorom boli prítomní aj súťažiaci z Karlovej Univerzity v Prahe.

Na ÚACH aj naďalej pracuje Snem mladých vedeckých pracovníkov, ktorý bol kreovaný ako poradný orgán riaditeľa ústavu. Snem združuje doktorandov a pracovníkov s VŠ vzdelaním do 35 rokov. Ich zástupkyňa, Ing. B. Kubíková, PhD. je členkou širšieho vedenia ústavu. Jej prostredníctvom majú členovia snemu možnosť aktívne sa podieľať na chode ústavu a zapájať sa aj do aktivít, ktoré priamo nesúvisia s doktorandským štúdiom. Výbor snemu spolu so svojimi členmi úspešne zorganizoval dňa 14.11.2013 Deň otvorených dverí na ÚACH SAV, ktorý sa konal v rámci Týždňa vedy na Slovensku. Táto akcia mala mimoriadny ohlas a zúčastnilo sa jej 225 študentov z bratislavských i mimobratislavských stredných i vysokých škôl. ÚACH sa prezentoval aj v rámci popularizačnej aktivity Noc výskumníkov.

4. Medzinárodná vedecká spolupráca

4.1. Medzinárodné vedecké podujatia

4.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2013 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia

Workshop Modern Methods in Quantum Chemistry, Mariapfarr, Rakúsko, 45 účastníkov, 24.02.-01.03.2013

V rámci podujatia bolo prednesených 21 prednášok. Účastníci: Fínsko, Nórsko, Francúzsko, Nemecko, Slovenská republika, Česká republika, Nový Zéland.

4.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2014 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)

11th Conference on Solid State Chemistry /11th Conference on Solid State Chemistry , Trenčianske Teplice, Slovensko, 06.07.-11.07.2014, (Miroslav Boča, 02/59410400, uachboca@savba.sk)

4.1.3. Počet pracovníkov v programových a organizačných výboroch medzinárodných konferencií

Tabuľka 4a Programové a organizačné výbory medzinárodných konferencií

| Typ výboru | Programový | Organizačný | Programový i organizačný |
|-----------------|------------|-------------|--------------------------|
| Počet členstiev | 7 | 3 | 0 |

4.2. Členstvo a funkcie v medzinárodných orgánoch

4.2.1. Členstvo a funkcie v medzinárodných vedeckých spoločnostiach, úniách a národných komitétach SR

Mgr Valéria Bizovská

Clay Mineral Society (funkcia: člen)

doc. RNDr. Milan Drábik, CSc.

European Association for Chemical and Molecular Sciences (EuCheMS) (funkcia: člen v divízii anorganická chémia)

Institute of Materials, Minerals and Mining, U.K. (funkcia: doživotný člen)

International Union of Pure and Applied Chemistry (IUPAC) (funkcia: titular member v divízii II anorganická chémia)

Slovenský národný komitét IUPAC (funkcia: predseda)

prof. Ing. Dušan Galusek, DrSc.

American Ceramic Society (funkcia: člen)

European Society on Glass Science and Technology (funkcia: člen)

RNDr. Peter Komadel, DrSc.

Clay Mineral Society (funkcia: President, 2012-2013, Past president 2013-2014)

European Clay Groups Association (funkcia: predseda 2011-2015)

Ing. Michal Korenko, PhD.

International Union of Pure and Applied Chemistry (IUPAC) (funkcia: National Representative (NR) of Division I)

doc. Ing. Zoltán Lenčéš, PhD.

American Ceramic Society (funkcia: člen)
Ceramic Society of Japan (funkcia: člen)
Council of the European Ceramic Society (funkcia: člen)
European Ceramic Society (funkcia: člen)
Materials Research Society (funkcia: člen)

RNDr. Jana Madejová, DrSc.

Clay Mineral Society (funkcia: člen)

Dr. Vladimír Malkin, DrSc.

WATOC - World Association of Theoretical and Computational Chemists (funkcia: člen)

prof. RNDr. Jozef Noga, DrSc.

World Association of Theoretical and Computational Chemists (funkcia: člen)

prof. RNDr. Pavol Šajgalík, DrSc.

American Ceramic Society (funkcia: člen)
Ceramic Society of Japan (funkcia: člen)
Council of the European Ceramic Society (funkcia: člen)
ECerS (funkcia: prezident)
International Ceramic Federation (funkcia: člen predstavenstva)
Materials Research Society (funkcia: člen)
Permanent Executive Committee ECerS (funkcia: volený člen)
World Academy of Ceramics (funkcia: volený člen)
World Academy of Ceramics - Výberová komisia pre nových členov (funkcia: volený člen)

doc. Ing. Peter Šimurka, PhD.

European Society on Glass Science and Technology (funkcia: člen)
International Commission on Glass (funkcia: výkonný tajomník)

4.3. Účast' expertov na hodnotení medzinárodných projektov (EÚ RP, ESF a iných)

Tabuľka 4b Experti hodnotiaci medzinárodné projekty

| Meno pracovníka | Typ programu/projektu/výzvy | Počet hodnotených projektov |
|-----------------|-----------------------------|-----------------------------|
| Noga Jozef | OTKA (Hungary) | 1 |

4.4. Najvýznamnejšie prínosy MVTs ústavu vyplývajúce z mobility a riešenia medzinárodných projektov a iné informácie k medzinárodnej vedeckej spolupráci

Ondrej Hanzel

Technische Universität Darmstadt Institut für Materialwissenschaft Fachgebiet, Disperse Feststoffe Arbeitsgruppe Polymerkeramik, Darmstadt, Nemecko 21. 11. – 18. 12. 2013. Pobyt sa uskutočnil v rámci medzinárodného projektu DAAD/SAV 54440408: *Ceramic Nanocomposites for Applications in Extreme Environments*. Počas pobytu boli zamerané a vyhodnotené Ramanove spektra korundových kompozitov s MWCNTs pripravených rôznymi postupmi.

Peter Cherry

UiT The Arctic University of Norway, Tromsø, Norsko; 22.11.2013 – 9.12.2013, práca vo vývoji programového balíka ReSpect v rámci projektu pNMR (FP7-PEOPLE-2012-ITN).

Stanislav Kedžuch

Ústav fyzikální chemie J. Heyrovského AV ČR, 25.11.-6.12.2013 Pobyt sa uskutočnil v rámci MAD medzi SAV a AV ČR. Spolupráca na vývoji multireferenčných explicitne korelovaných metód. Implementácia multireferenčnej Mukherjee metódy v rámci teórie spriahnutých klastrov so zahrnutím triexcitácií Mk-MR-CCSD(T)-F12 pre open-shell systémy, aplikácie metódy.

Michal Korenko

Northeastern University, Čína, 13. - 28. 10. 2013. Pobyt sa uskutočnil v rámci bilaterálneho čínsko-slovenského APVV projektu (SK-CN 0029-12) medzi Ústavom anorganickej chémie SAV a School of Non-ferrous Metallurgy NEU v Shenyangu. Náplňou práce bolo uskutočnenie experimentov zahrnutých v spoločnom projekte *Physico-chemical Properties of Molten Fluoride Electrolytes for SoG-Si Electrowinning*.

Institute of Chemistry and Technology of Rare Elements and Mineral Raw Materials, Russian Academy of Sciences, Apatity, Rusko, 5. - 25. 6. 2013; pobyt sa uskutočnil v rámci medziakademickej spolupráce (MAD) medzi Ústavom anorganickej chémie SAV a ústavu RAS v Apatitoch. Náplňou práce bolo uskutočnenie experimentov zahrnutých v spoločnom projekte *Electrochemistry of Lanthanides in Molten Fluorides*.

Olga Malkin

Fukui Institute - Kyoto, Okazaki University, Nagoya University, Waseda University – Tokyo, Metropolitan University – Tokyo, Sendai University, Japonsko; 12.11.2013 – 1.12.2013; prezentácia vedeckých výsledkov získaných v Ústave anorganickej chémie, SAV a diskusia o možnej spolupráci.

Vladimír Malkin

Fukui Institute - Kyoto, Okazaki University, Nagoya University, Waseda University – Tokyo, Metropolitan University – Tokyo, Sendai University, Japonsko; 12.11.2013 – 1.12.2013; prezentácia vedeckých výsledkov získaných v Ústave anorganickej chémie, SAV a diskusia o možnej spolupráci.

Helena Pálková

Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Krakow, Poľsko, 12. – 20. 11. 2013. Pobyt sa uskutočnil v rámci medziakademickej spolupráce (MAD) medzi Ústavom anorganickej chémie SAV a ústavu PAV v Krakowe. Náplňou práce bolo uskutočnenie experimentov zahrnutých v spoločnom projekte „Organo-clays as intermediates for the synthesis of functional hybrid materials”.

Michal Vetrecin

Technische Universität Darmstadt Institut für Materialwissenschaft Fachgebiet, Disperse Feststoffe Arbeitsgruppe Polymerkeramik, Darmstadt, Nemecko 21. 11. – 18. 12. 2013. Pobyt sa uskutočnil v rámci medzinárodného projektu DAAD/SAV 54440408: *Ceramic Nanocomposites for Applications in Extreme Environments*. Počas pobytu sa pripravili pre-keramické polyméry určený pre prípravu kompozitov nitridovej keramiky s prísadami spekania aluminum, hafnium a lutécium nitridovej keramiky.

Dlhodobé pobyty pracovníkov ústavu realizované na základe získania štipendií na riešenie projektov

Františka Frajkorová

Vysoké učení technické, Brno, Česká republika, postdoktorand odborného tímu v rámci projektu 'Excelentní mladí vědci na VUT v Brně CZ 1.07/2.3.00/30.0039 '. Trvanie projektu 1.9.2012 -

31.5.2015. Priprava nových typov kompozitných biomaterialov s potenciálnym využitím v medicíne.

Peter Hrobárik

Institut für Chemie, Technische Universität Berlin (10. 2010 – 12. 2014). Postdoktorandský výskumný pobyt v Nemecku podporovaný nadáciou Alexander von Humboldt a Berlínskym centrom excelentnosti "UniCat". Projekt je zameraný na vývoj a aplikáciu nových relativistických metód pre výpočet a interpretáciu NMR spektier zlúčenín prechodných kovov a aktinoidov, ako aj na štúdium štruktúry a reakčných mechanizmov významných priemyselných katalyzátorov.

Stanislav Komorovský

The Centre for Theoretical and Computational Chemistry, Department of Chemistry, University of Tromsø, Nórsko, postdoktorandský výskumný pobyt (15. 5. 2012 – 14. 5. 2015)

Marián Kucharík

Primary Metal Technology (PMT) - Technology development, Hydro Aluminium a.s. Årdal, Nórsko, projektový inžinier, 01. 11. 2008 – 31. 12. 2013. Výskum a vývoj technológie výroby hliníka Hall-Heroultovým procesom.

Martin Michálek

EMPA, High Performance Ceramics Laboratory, Dübendorf, Švajčiarsko – Post doktorandský pobyt v rámci projektu "High performance ceramics in harsh environments" (01. 09. 2013 – 31. 08. 2015)

Martin Pentrák

Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana, USA, Postdoctoral Research Associate, 04. 2012 – 09. 2014, výskum a vývoj nových progresívnych nanokompozitov na báze organoílov dôležitých pri riešení environmentálnych a priemyselných problémov, štúdium optických a termických vlastností prírodných nanomateriálov na báze ílových minerálov.

Linda Pentráková

Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana, USA, Postdoctoral Research Associate, 06. 2012 – 09. 2014, výskum a vývoj nových progresívnych nanokompozitov na báze organoílov dôležitých pri riešení environmentálnych a priemyselných problémov, štúdium optických a termických vlastností prírodných nanomateriálov na báze ílových minerálov.

Michal Repiský

The Centre for Theoretical and Computational Chemistry, Department of Chemistry, University of Tromsø, Nórsko, postdoktorandský výskumný pobyt v rámci projektu "Norwegian Center of Excellence", 01. 01. 2010 – 31. 12. 2013.

Prednášky zahraničných pracovníkov, ktorí navštívili ÚACH SAV

Ing. Přemysl BERAN, PhD., Ústav jaderné fyziky AV ČR, v. v. i., Husinec – Řež, Česká republika

What's the matter between the neutrons and matter (28. 5. 2013)

Dr. Lukáš PALATINUS, Fyzikální ústav AV ČR,

Analýza krystalových struktur pomocí difrakce elektronů (6. 11. 2013)

Prof. Trond SAUE, Laboratoire de Chimie et Physique Quantiques, Université de Toulouse, Francúzsko

Relativistic simulations of Mössbauer spectroscopy (7. 11. 2013)

Prehľad údajov o medzinárodnej mobilite pracovníkov organizácie je uvedený v Prílohe E.

Prehľad a údaje o medzinárodných projektoch sú uvedené v kapitole 2 a Prílohe B.

5. Vedná politika

Vedná politika ústavu reflektuje dlhodobé zámery ako aj aktuálne trendy súvisiace so spoločenskou objednávkou na domácej a zahraničnej scéne. Je založená na inovatívnosti vedeckého smerovania, ambicióznosti vedeckých osobností, ako aj autonómnosti vedúcich vedeckých tímov. Správnosť tohto smerovania dokumentuje pozícia ústavu, ktorý je hodnotený na popredných priečkach vo všetkých procesoch hodnotenia v SAV.

Základnými a dominantnými cieľmi, ktorým sú podriadené všetky aspekty chodu ústavu, sú odborný rast, medzinárodná integrácia a spoločenské uplatnenie/úžitok výsledkov výskumu. Napĺňanie uvedených cieľov si vyžaduje komplexný prienik aspektov, ako sú:

- aktívna účasť na domácich a zahraničných projektoch,
- aktívna publikačná činnosť v medzinárodných časopisoch a prezentácia výsledkov výskumu na medzinárodných vedeckých fórach,
- zachovanie vekovej a odbornej kontinuity,
- vytvorenie podmienok pre vzdelávanie a odborný rast, PhD študentov aj mladých vedeckých pracovníkov, ale aj erudovaných vedeckých pracovníkov,
- aktívna účasť na vzdelávacom procese s dôrazom na druhý a tretí stupeň vysokoškolského vzdelania,
- technické zabezpečenie pre výskum,
- finančné zabezpečenie výskumu,
- personálna politika,
- zabezpečenie kontinuity vo oblasti vedenia organizačných štruktúr ústavu, vytvorenie podmienok pre manažérsky rast pracovníkov,
- diseminácia a popularizácia objektov a výsledkov výskumu v odbornej a laickej spoločnosti,
- spolupráca a kooperácia s domácimi a zahraničnými partnermi akademickými, ako aj priemyselnými,
- zabezpečenie fungovania administratívnych požiadaviek.

Projektové tímy

Štruktúra ústavu v sebe inherentne zahŕňa flexibilné projektové tímy, ktoré sú vytvárané s ohľadom na objektové, resp. metodické možnosti a schopnosti jednotlivcov spájajúcich sa účelovo pri príprave a riešení projektov MŠ SR (štátne programy, projekty ŠF), VEGA, APVV, rámcových programov EÚ, NATO a v spolupráci s domácimi a zahraničnými partnermi z priemyslu. Táto flexibilná projektová štruktúra umožňuje pracovníkom resp. odborným skupinám podieľať sa na príprave vnútroústavných alebo aj nadústavných vedeckých zoskupení buď v rámci ústavu a SAV alebo aj mimo nich. Vedúci projektových tímov sú autonómni v rozhodovaní o spôsoboch riešenia projektu ako aj v nakladaní s finančnými prostriedkami v súlade s projektovými cieľmi a zmluvou.

Personálna politika

V oblasti personálnej politiky sa ústavu dlhodobo darí udržať priemerný vek zamestnancov v rozpätí 40 až 45 rokov. Podpora zamestnávania mladých vedeckých pracovníkov patrí medzi prioritné úlohy vedenia ústavu. Pre zvýšenie počtu a motivácie mladých absolventov doktorandského štúdia, aby neodchádzali z oblasti vedy do finančne lukratívnejších zamestnaní, boli prijaté nasledujúce zásady personálnej politiky:

- a/ Získavanie najlepších študentov na doktorandské štúdium vo vedných odboroch, ktoré má ústav akreditované ako externá vzdelávacia inštitúcia.
- b/ Získavanie zahraničných doktorandov prostredníctvom projektov Marie Curie Research Training Network alebo iných schém podpory zahraničných študentov (napr. DAAD), v ktorých je ústav zapojený.
- c/ Vysielanie čerstvých absolventov doktorandského štúdia na dlhodobé (najmenej 3 mesiace)

pobyty do zahraničia, aby sa zoznámili s najmodernejšou prístrojovou technikou, laboratórnymi postupmi, ako aj metódami práce vo vyspelých pracoviskách v Európe a vo svete (najčastejšie Japonsko a USA).

d/ Organizovanie medzinárodných podujatí doma, ako aj vysielanie mladých vedeckých pracovníkov a aj doktorandov na renomované konferencie v zahraničí s cieľom získať skúsenosti s prezentovaním vedeckých výsledkov.

e/ Pozývanie renomovaných odborníkov zo zahraničia na prednášky pre doktorandov a zamestnancov ústavu.

Technická infraštruktúra

Neoddeliteľnou súčasťou vedenej politiky je aj rozvoj infraštruktúry. Ústav cielene buduje svoju infraštruktúru na rôznych úrovniach cez laboratóriá na prípravu vzoriek až po laboratória na charakterizáciu pripravených materiálov. Vyžaduje si to dlhodobú aktivitu postupnej rekonštrukcie priestorov, ktorá je pre svoje špecifické požiadavky náročná ako finančne tak aj časovo, pretože prebieha pri plnej prevádzke ostatných zariadení. Prístrojové vybavenie sleduje vzájomnú komplementaritu techník. Snahou je aj poskytovať voľné časové kapacity na merania pre partnerov na Slovensku ako aj zapájanie ústavu prostredníctvom technickej infraštruktúry do medzinárodných zväzkov. Prostriedky na moderné zariadenia plynú predovšetkým z projektov štrukturálnych fondov.

6. Spolupráca s univerzitami/vysokými školami, štátnymi a neziskovými inštitúciami okrem aktivít uvedených v kap. 2, 3, 4

6.1. Spolupráca s univerzitami/VŠ (fakultami)

Názov univerzity/vysokej školy a fakulty: Fakulta matematiky, fyziky a informatiky UK

Druh spolupráce (spoločné pracovisko alebo iné): Spoločná výchova diplomantov

Začiatok spolupráce: 2001

Zameranie: účasť na Bc. a Mgr. výuke

Zhodnotenie: Pracovníci ÚACH viedli na FMFI UK v roku 2013 dvoch diplomantov.

Názov univerzity/vysokej školy a fakulty: Prírodovedecká fakulta UK

Druh spolupráce (spoločné pracovisko alebo iné): Spoločná výchova doktorandov, spoločné riešenie projektov, spolupráca v pedagogickom procese

Začiatok spolupráce: 1990

Zameranie: vedecká spolupráca, účasť na Bc. a Mgr. výuke

Zhodnotenie: V spolupráci s touto fakultou je ústav zapojený do vzdelávania na III. stupni vysokoškolského štúdia v študijných programoch anorganická chémia a chemická fyzika. Spoločne sa riešia projekty VEGA a APVV. Prof. RNDr. J. Noga, DrSc., doc. RNDr. J. Bujdák, DrSc. a doc. RNDr. M. Drábik, CSc. majú hlavný úväzok na fakulte a čiastkový na ÚACH SAV. Prof. RNDr. J. Noga, DrSc. je externým členom Vedeckej rady ÚACH SAV. Pracovníci ÚACH viedli na PríFUK v roku 2013 trinástich doktorandov.

Názov univerzity/vysokej školy a fakulty: Fakulta chemickej a potravinárskej technológie STU

Druh spolupráce (spoločné pracovisko alebo iné): Spoločné pracovisko, spoločná výchova doktorandov

Začiatok spolupráce: 1990

Zameranie: vedecká spolupráca

Zhodnotenie: Na základe dodatku k zmluve o zriadení spoločného pracoviska je FCHPT od roku 2008 členom konzorcia a spoluzriaďovateľom spoločného pracoviska, Centra kompetencie skla Vitrum Laugaricio – VILA. Prof. Ing. D. Galusek, DrSc. je vedúcim Oddelenia keramiky, skla a cementu. FCHPT STU je partnerom projektu APVV 0218-11 - Mechanizmy korózie a mikromechanické vlastnosti dentálnych materiálov a hlavným riešiteľom APVV projektu Polyaplikovateľné heterocykly - návrh štruktúry, syntéza a vlastnosti, v ktorom ÚACH vystupuje ako partner. Pracovníci ÚACH viedli na FCHPT v roku 2013 jedenástich doktorandov.

Názov univerzity/vysokej školy a fakulty: Hutnícka fakulta TUKE

Druh spolupráce (spoločné pracovisko alebo iné): Spolupráca v pedagogickom procese

Začiatok spolupráce: 2000

Zameranie: vedecká spolupráca, účasť na Bc. a Mgr. výuke

Zhodnotenie: V spolupráci s touto fakultou je ústav zapojený do pedagogického procesu. Prof. RNDr. P. Šajgalík, DrSc. je členom vedeckej rady fakulty.

Názov univerzity/vysokej školy a fakulty: Trenčianska univerzita Alexandra Dubčeka v Trenčíne

Druh spolupráce (spoločné pracovisko alebo iné): Centrum kompetencie skla - Vitrum Laugaritio

Začiatok spolupráce: 1997

Zameranie: vedecká spolupráca

Zhodnotenie: Okrem spoločného pracoviska s TnU AD (Centrum kompetencie skla Vitrum Laugaritio) riešil ÚACH SAV v roku 2013 v spolupráci s touto univerzitou jeden spoločný projekt

VEGA a tri spoločné projekty APVV. V spolupráci s TnU AD sa v rámci Operačného programu VaV riešil projekt „Centrum excelentnosti pre keramiku, sklo a silikátové materiály” akronym CEKSIM, ITMS kód 26220120056. Projekt financovaný v celkovej sume 3,9 milióna € umožnil kompletne vybavenie centra v priestoroch TnU AD experimentálnou a prístrojovou technikou a rozvíjanie a prehĺbovanie ďalšej spolupráce medzi oboma inštitúciami. Prof. Ing. P. Galusek, DrSc. je členom Vedeckej rady TnU AD, prof. Ing. M. Liška, DrSc. je externým členom Vedeckej rady ÚACH. Pracovníci centra, zamestnanci ÚACH, sa podieľajú na pedagogickej činnosti v rámci vysokoškolského štúdia v odbore "Chemické technológie" a doktorandského štúdia v odbore "Anorganická technológia a materiály" na TnU AD.

Názov univerzity/vysokej školy a fakulty: Vysoké učení technické, Brno

Druh spolupráce (spoločné pracovisko alebo iné): Spoločná výchova doktorandov, spoločné riešenie projektov, spolupráca v pedagogickom procese

Začiatok spolupráce: 2000

Zameranie: vedecká spolupráca, účasť na Bc. a Mgr. výuke

Zhodnotenie: V spolupráci s touto fakultou nie je v súčasnosti ústav zapojený do pedagogického procesu. S FCH VUT Brno ústav plánuje zriadiť spoločné pracovisko pre výskum a vývoj nanomateriálov. Prof. RNDr. P. Šajgalík, DrSc. a prof. Ing. M. Liška, DrSc. sú členmi Vedeckej rady FCH VUT Brno.

Názov univerzity/vysokej školy a fakulty: Vysoká škola báňská - TU Ostrava, Česká republika

Druh spolupráce (spoločné pracovisko alebo iné): Spoločná výchova doktorandov, spoločné riešenie projektov

Začiatok spolupráce: 2010

Zameranie: vedecká spolupráca, výchova doktorandov

Zhodnotenie: Spolupráca VŠB a ÚACH je zameraná na výchovu mladých pracovníkov. Na ÚACH sa školia 3 doktorandky z VŠB Ostrava. Doc. Ing. M. Hnatko, PhD. a doc. Ing. Lenčేశ, PhD. sú menovaní školiteľmi špecialistami týchto doktorandov. Prof. RNDr. P. Šajgalík, DrSc. je členom Vedeckej rady FMMI VŠB; doc. Ing. Z. Lenčేశ, PhD. je členom odborovej rady doktorandského študijného programu Materiálové vedy a inžinýrství.

Názov univerzity/vysokej školy a fakulty: University of Ghent, Belgicko

Druh spolupráce (spoločné pracovisko alebo iné): Department of Inorganic and Physical Chemistry

Začiatok spolupráce: 2010

Zameranie: vedecká spolupráca

Zhodnotenie: Vedecká spolupráca pri príprave amorfných a polykryštalických materiálov sol-gel metódami v systémoch $\text{Al}_2\text{O}_3\text{-La}_2\text{O}_3$, $\text{Al}_2\text{O}_3\text{-La}_2\text{O}_3\text{-ZrO}_2$, $\text{Al}_2\text{O}_3\text{-Y}_2\text{O}_3$. Skúmanie vlastností pripravených materiálov a spoločné publikácie.

6.2. Významné aplikácie výsledkov výskumu v spoločenskej praxi alebo vyriešenie problému pre štátnu alebo neziskovú inštitúciu

6.3. Iná činnosť využiteľná pre potreby spoločenskej praxe

Spoločné pracovisko FTIR spektroskopie: V rámci pracoviska sa dlhodobo využíva FTIR spektrometer Nicolet Magna 750, zakúpený z prostriedkov partnerov z ÚACH SAV, CHÚ SAV, FCHPT STU a PríF UK ako aj FTIR spektrometer Nicolet 6700 s príslušenstvom, financovaný z prostriedkov projektu APVV-VVCE Výskumno-vzdelávacie centrum excelentnosti pre výskum pevnej fázy so zameraním na nanomateriály, environmentálnu mineralógiu a materiálovú technológiu (2008-2011), na ktorý čiastočne prispel aj CHÚ SAV.

7. Spolupráca s aplikačnou a hospodárskou sférou okrem aktivít uvedených v kap. 2, 3, 4

7.1. Spoločné pracoviská s aplikačnou sférou

Názov pracoviska: Spoločné pracovisko Ústavu anorganickej chémie Slovenskej akadémie vied a RONA, a.s.

Partner(i): Rona a.s., Lednické Rovne

Zameranie: Stimulácia, rozvoj a realizácia základného a aplikovaného výskumu a vývoja v oblastiach súvisiacich s existujúcou priemyselnou základňou SR

Rok založenia: 2011

Zhodnotenie: V 05/2011 bola podpísaná partnerská zmluva a štatút Spoločného pracoviska medzi partnermi. Realizovalo sa hodnotenie úloh za prvých 12 mesiacov projektu a začala sa príprava programu pre ďalší rok projektu. Informácia o vzniku spoločného pracoviska ako aj výsledky jeho činnosti boli prezentované na tlačovej konferencii. ÚACH v spolupráci s RONA v rámci Operačného programu VaV rieši projekt s názvom "Priemyselný výskum pre potreby zefektívnenia unikátnej technológie tavenia a tvarovania úžitkového skla", akronym PVTECHSKLO. Finančné prostriedky tohto projektu sú v celkovej výške 1 400 281 €, z čoho pre ÚACH SAV pripadne 436 700 €.

7.2. Kontraktový – zmluvný výskum (vrátane zahraničných kontraktov)

Názov kontraktu: Silicon nitride sialons for refractory

Partner(i): RHI AG, Technology Center, Standort Leoben, Austria; Montan Universität, Leoben, Austria

Začiatok spolupráce (v súlade s podpísaným kontraktom): 2008

Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2014

Objem získaných prostriedkov v bežnom roku (€): 12530

Stručný opis výstupu/výsledku: Vývoj nových žiaruvzdorných materiálov na báze Al₂O₃-SiAlON a MgO-MgAlON.

Zhodnotenie: Partner RHI AG predĺžil kontrakt s ÚACH SAV do roku 2014.

Názov kontraktu: Alternative Werkstoffe für Pumpenkomponenten

Partner(i): Materials Center Leoben, Austria; Andritz GmbH, Graz, Austria

Začiatok spolupráce (v súlade s podpísaným kontraktom): 2011

Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2014

Objem získaných prostriedkov v bežnom roku (€): 17020

Stručný opis výstupu/výsledku: Testy využiteľnosti MDF materiálov a technológií pre inovatívne materiály v pumpách a ich komponentoch.

Zhodnotenie: Partner Materials Center Leoben potvrdil aktualizáciu úloh a kontrakt do apríla 2014.

7.3. Iná činnosť využiteľná pre potreby hospodárskej praxe

V spolupráci s priemyselným partnermi riešil ÚACH dva projekty štrukturálnych fondov zamerané na riešenie konkrétnych problémov spoločenskej praxe: Znalostná databáza a expertný systém environmentálneho riešenia havárií straty chladiva v prevádzke jadrovej elektrárne. Zodpovedný riešiteľ doc. Ing. Peter Šimurka, CSc., ITMS 262 202 200 84, priemyselný partner VÚEZ, a.s. a Priemyselný výskum pre potreby zefektívnenia unikátnej technológie tavenia a tvarovania úžitkového skla, zodpovedný riešiteľ doc. Ing. Peter Šimurka, CSc., ITMS 262 202 200 72 priemyselný partner RONA, a. s.

8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné organizácie

8.1. Členstvo v poradných zboroch vlády SR, Národnej rady SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

Tabuľka 8a Členstvo v poradných zboroch Národnej rady SR, vlády SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

| Meno pracovníka | Názov orgánu | Funkcia |
|-----------------------------------|--|---|
| Mgr. Stanislav Kedžuch, PhD. | Slovenská komisia chemickej olympiády | podpredseda |
| Ing. Michal Korenko, PhD. | Komisia pre námietky pri verejnom obstarávaní | externý člen |
| prof. RNDr. Jozef Noga, DrSc. | Akreditačná komisia SR | člen pracovnej skupiny pre oblasť výskumu Chémia, chemická technológia a biotechnológie |
| prof. RNDr. Pavol Šajgalík, DrSc. | Komisia ministra školstva pre udeľovanie Ceny ministra školstva | člen |
| | Slovenská komisia pre vedecké hodnosti (SKVH) | predseda |
| | Komisia MŠ na vyhodnocovanie žiadostí o stimuly na výskum a vývoj | člen komisie |
| | Agentúra na podporu výskumu a vývoja - podpora prípravy projektov 7. Rámcového programu výskumu a vývoja | člen komisie |
| | Rada predsedov expertných pracovných skupín pre prípravu strategického dokumentu „Stratégia výskumu a vývoja v SR do roku 2012 | Predseda rady predsedov |
| | Komisia MŠ pre prioritné oblasti aplikovaného výskumu a experimentálneho vývoja v SR | člen pracovnej skupiny |
| | Agentúra na podporu výskumu a vývoja - komisia pre nový spôsob hodnotenia projektov | predseda |
| Ing. Daniel Tunega, CSc. | Akreditačná komisia SR | člen pracovnej skupiny pre oblasť výskumu Chémia, chemická technológia a biotechnológie |

8.2. Expertízna činnosť a iné služby pre štátnu správu a samosprávu

Názov expertízy: Spoluautor úloh Chemickej olympiády

Adresát expertízy: MŠ SR

Spracoval: Mgr. Stanislav Kedžuch, PhD.

Názov expertízy: Poznatkami k prosperite - Stratégia výskumu a inovácií pre inteligentnú špecializáciu Slovenskej republiky

Adresát expertízy: Vláda SR

Spracoval: prof. RNDr. Pavol Šajgalík, DrSc.

Stručný opis: Materiál schválila Vláda SR na svojom zasadnutí 13.11.2013 ako ex ante kondicionalitu pre nový Operačný program Veda, výskum a inovácie

8.3. Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

Tabuľka 8b Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

| Meno pracovníka | Názov orgánu | Funkcia |
|-----------------------------------|--|--|
| prof. RNDr. Pavol Šajgalík, DrSc. | Ministerstvo školstva, vedy, výskumu a športu SR | predseda Rady predsedov pre priority výskumu |

8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnyimi a parlamentnými orgánmi alebo pre ich potrebu

9. Vedecko-organizačné a popularizačné aktivity

9.1. Vedecko-popularizačná činnosť

9.1.1. Najvýznamnejšia vedecko-popularizačná činnosť pracovníkov organizácie SAV

Tabuľka 9a Vedecko-popularizačná činnosť pracovníkov organizácie SAV

| Meno | Spoluautori | Typ ¹ | Názov | Miesto zverejnenia | Dátum alebo počet za rok |
|-------------------|-----------------------|------------------|---|---|--------------------------|
| Mgr. Mária Kádek | L. Konečný | PB | Je chémia fyzika či mágia? | FMFI UK v Bratislave | 25.9.2013 |
| Peter Komadel | | TL | Chemik Komadel: Vymyslel som som triviálnu vec a každý sa smial | SME | 31.7.2013 |
| Peter Komadel | F. Simančík, I. Lacík | TL | Naši špičkoví vedci | Týždeň | 26.8.2013 |
| Blanka Kubíková | | IN | Slávnostný vedecký seminár ÚACH SAV pri príležitosti 60. výročia jeho založenia | www.sav.sk | 13.5.2013 |
| Vladimír Malkin | | TL | "S Vladimírom Malkinom o molekulách" | Týždeň, str. 43 | 24.6.2013 |
| Vladimír Malkin | | TL | Dvaja Rusi na špiči slovenskej vedy | Pravda, str 20-22 | 5.10.2013 |
| Pavol Šajgalík | | TV | HOSTĽ V ŠTÚDIU: Pavol Šajgalík o financovaní SAV | TA3 (http://www.ta3.com/clanok/1025175/host-v-studiu-pavol-sajgalik-o-financovani-sav.html) | 16.8.2013 |
| Pavol Šajgalík. | | TL | Chemik Šajgalík: Naši vedci ukázali magnetický plášť neviditeľnosti | TECH.sme (http://tech.sme.sk/c/6660049/chemik-sajgalik-nasi-vedci-ukazali-magneticky-plast-neviditelnosti.html) | 8.1.2013 |
| Pavol Šajgalík | | RO | PAVOL ŠAJGALÍK, riaditeľ Ústavu anorganickej chémie SAV - rozhovor (o vede a vedcoch, výskume, ale aj o tom, ako súvisí šálka po starej mame s ochranným plášťom raketoplánu) | Rádio BEST FM | 29.5.2013 |
| Miroslav Hnatko | | IN | popisuje Proces transferu technológií (TT) z akademickej sféry do spoločenskej a hospodárskej praxe - informačný videozáznam | http://nptt.cvtisr.sk/sk/multimedialna-galeria-o-transfere-technologie/tt-video.html?page_id=1132 | 1 |
| Stanislav Kedžuch | | PB | Odborné sústreďenia z chémie, biológie a prírodných vied pre študentov základných a | Bardejov 7-21.6.2013 (3 semináre) | 3 |

| | | | | | |
|-----------------|-----------|----|--|--------------------|---|
| | | | stredných škôl (5.-18.6.2012) | | |
| Blanka Kubíková | | TL | 60. výročie založenia Ústavu anorganickej chémie | ChemZi, 9(1) | 1 |
| Blanka Kubíková | | TL | Ocenili vysokú úroveň výskumu | Správy SAV, 4/2013 | 1 |
| Pavol Šajgalík | Z. Lenčes | TL | Svetlo a svietenie inak – výskum luminofórov na Ústave anorganickej chémie SAV | Quark, str. 20-21 | 1 |

¹ PB - prednáška/beseda, TL - tlač, TV - televízia, RO - rozhlas, IN - internet, EX - exkurzia, PU - publikácia, MM - multimédia, DO - dokumentárny film

9.1.2. Súhrnné počty vedecko-popularizačných činností organizácie SAV

Tabuľka 9b Súhrnné počty vedecko-popularizačných činností organizácie SAV

| Typ | Počet | Typ | Počet | Typ | Počet |
|------------------|-------|----------------------|-------|--------------------|-------|
| prednášky/besedy | 2 | tlač | 8 | TV | 2 |
| rozhlas | 2 | internet | 2 | exkurzie | 1 |
| publikácie | 0 | multimediálne nosiče | 0 | dokumentárne filmy | 0 |
| iné | 0 | | | | |

9.2. Vedecko-organizačná činnosť

Tabuľka 9c Vedecko-organizačná činnosť

| Názov podujatia | Domáca/ medzinárodná | Miesto | Dátum konania | Počet účastníkov |
|---|-------------------------|--------------------------------|-------------------|---------------------|
| Ľalové minerály a vybrané nerudné suroviny v materiálovom výskume a priemyselných aplikáciách | domáca | Hotel Akadémia, Stará Lesná | 03.06.-05.06.2013 | 26 |
| Príprava a vlastnosti progresívnych keramických materiálov | domáca | Ružín | 18.11.-19.11.2013 | 30 |
| Workshop Modern Methods in Quantum Chemistry | medzinárodná | Mariapfarr, Rakúsko | 24.02.-01.03.2013 | 45 |

9.3. Účasť na výstavách

Názov výstavy: Noc výskumníkov 2013

Miesto konania: Bratislava

Dátum: 27.9.2013

Zhodnotenie účasti: Prezentácia výsledkov oddelenia keramiky (Z. Lenčes, M. Hnatko, M. Vetrecin, P. Šajgalík)

9.4. Účasť v programových a organizačných výboroch národných konferencií

Tabuľka 9d Programové a organizačné výbory národných konferencií

| Typ výboru | Programový | Organizačný | Programový i organizačný |
|-----------------|------------|-------------|--------------------------|
| Počet členstiev | 0 | 0 | 4 |

9.5. Členstvo v redakčných radách časopisov

doc. Ing. Miroslav Boča, PhD.

Chemical Papers (funkcia: Associate editor pre anorganickú chémiu do 8/2013)

Chemical Papers (funkcia: Editorial Advisory Board od 9/2013)

doc. RNDr. Milan Drábik, CSc.

Ceramics-Silikáty (funkcia: člen)

ChemZi (funkcia: člen)

prof. Ing. Dušan Galusek, DrSc.

Ceramics-Silikáty (funkcia: člen)

New Journal of Glass and Ceramics (funkcia: člen)

RNDr. Peter Komadel, DrSc.

Applied Clay Science (funkcia: člen)

Clay Minerals (funkcia: člen)

Geologica Carpathica (funkcia: člen)

prof. Ing. Marek Liška, DrSc.

Ceramics - Silikáty (funkcia: člen)

European Journal of Glass Science and Technology (funkcia: regional editor)

International Journal of Applied Glass Science (funkcia: člen)

Sklář a keramik (funkcia: člen)

prof. RNDr. Pavol Šajgalík, DrSc.

Ceramics-Silikáty (funkcia: člen)

Journal of Asian Ceramic Society (funkcia: spolueditor)

Journal of Ceramic Science and Technology (funkcia: člen)

Keramický Zpravodaj (funkcia: člen)

Processing and Application of Ceramics (funkcia: člen)

9.6. Činnosť v domácich vedeckých spoločnostiach

Ing. Peter Barborík

Slovenská chemická spoločnosť (funkcia: člen)

Mgr. Valéria Bizovská

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská ílová spoločnosť (funkcia: člen)

doc. Ing. Miroslav Boča, PhD.

Humboldtov klub v SR (funkcia: člen)

Slovenská chemická spoločnosť (funkcia: člen)

Mgr. Peter Boháč

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská ílová spoločnosť (funkcia: člen)

Mgr. Anna Brtáňová, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

doc. RNDr. Juraj Bujdák, DrSc.

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská ílová spoločnosť (funkcia: člen)

Mgr. Adriana Czímerová, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

Mgr. Alexander Čeklovský, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

Slovenská spektroskopická spoločnosť (funkcia: člen)

doc. RNDr. Milan Drábik, CSc.

Slovenská chemická spoločnosť (funkcia: člen Predsedníctva SCHS (od r. 2009))

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

prof. Ing. Dušan Galusek, DrSc.

Humboldtov klub v SR (funkcia: člen)

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

Slovenská sklárska spoločnosť (funkcia: člen predstavenstva, vedecký tajomník)

Ing. Dagmar Galusková, PhD.

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

Slovenská Sklárska spoločnosť (funkcia: člen predstavenstva)

Ing. Veronika Gurišová

Slovenská chemická spoločnosť (funkcia: člen)

doc. Ing. Miroslav Hnatko, PhD.

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

Ing. Mária Chromčíková, PhD.

Česká sklárska spoločnosť (funkcia: člen)

Slovenská sklárska spoločnosť (funkcia: člen)

Mgr. Ľuboš Jankovič, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

Mgr. Stanislav Kedžuch, PhD.

Slovenská chemická spoločnosť (funkcia: člen predsedníctva)

RNDr. Peter Komadel, DrSc.

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská chemická spoločnosť (funkcia: člen výboru Odbornej skupiny anorganická chémia)

Slovenská ílová spoločnosť (funkcia: podpredseda)

Učená spoločnosť SAV (funkcia: člen)

Ing. Michal Korenko, PhD.

Slovenská chemická spoločnosť (funkcia: predseda revíznej komisie)

Slovenská nukleárna spoločnosť (funkcia: člen)

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

Slovenská spoločnosť pre povrchové úpravy (funkcia: člen)

Ing. Jozef Kraxner, PhD.

Slovenská Sklárska spoločnosť (funkcia: člen)

Ing. Blanka Kubíková, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

Ing. Marián Kucharík, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

doc. Ing. Zoltán Lenčes, PhD.

Humboldtov klub v SR (funkcia: člen)

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen výboru)

prof. Ing. Marek Liška, DrSc.

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská sklárska spoločnosť (funkcia: člen)

RNDr. Jana Madejová, DrSc.

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská ílová spoločnosť (funkcia: predseda)

Učená spoločnosť SAV (funkcia: člen)

Ing. Zuzana Netriová, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

prof. RNDr. Jozef Noga, DrSc.

Humboldtov klub v SR (funkcia: člen)

Slovenská akademická spoločnosť (funkcia: podpredseda)

Učená spoločnosť SAV (funkcia: vedecký tajomník, od 6.11. 2013 predseda spoločnosti)

Ing. Helena Pálková, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

Ing. Viliam Pavlík, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

Ing. Martin Pentrák, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

Ing. Anna Prnová, PhD.

Slovenská Sklárska spoločnosť (funkcia: člen)

Ing. Samuel Sas

Slovenská ílová spoločnosť (funkcia: člen)

Ing. Jaroslav Sedláček, PhD.

Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

Ing. Ľudmila Sekeráková

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská ílová spoločnosť (funkcia: člen)

Ing. Eva Scholtzová, CSc.

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská ílová spoločnosť (funkcia: člen)

prof. RNDr. Pavol Šajgalík, DrSc.

Humboldtov klub v SR (funkcia: člen)

Slovenská chemická spoločnosť (funkcia: člen)

Slovenská silikátová vedecko-technická spoločnosť (funkcia: predseda)

Slovenská sklárska spoločnosť (funkcia: člen predstavenstva)

Učená spoločnosť SAV (funkcia: člen)

Ing. František Šimko, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

doc. Ing. Peter Šimurka, PhD.

Slovenská sklárska spoločnosť (funkcia: predseda)

Zväz slovenských vedecko-technických spoločností (funkcia: člen rady)

Mgr. Peter Švančárek, PhD.

Slovenská sklárska spoločnosť (funkcia: člen)

Ing. Jana Valúchová, PhD.

Slovenská ílová spoločnosť (funkcia: člen)

Ing. Zuzana Vasková, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

9.7. Iné dôležité informácie o vedecko-organizačných a popularizačných aktivitách

Na valnom zhromaždení Učenej spoločnosti SAV bola dňa 6.11.2013 zvolená nová Rada Učenej spoločnosti SAV, z členov ktorých za predsedu Učenej spoločnosti bol v druhom kole volieb zvolený doterajší vedecký tajomník UČS prof. RNDr. Jozef Noga, DrSc. Vzhľadom na to, že UČS je čestným orgánom SAV a podporuje rozvoj vedy a rozširovanie vedeckých poznatkov, iniciatívne sleduje etické otázky výskumu a jeho aplikácií v praxi, vyjadruje sa k základným problémom a právnym normám vedy a techniky a k smerovaniu výskumu v SAV a v Slovenskej republike, reprezentuje SAV, je predsedanie tejto spoločnosti významným honorom, ktorý na druhej strane zaväzuje. Schopnosti a výsledky prof. Nogu ho predurčujú na to, aby tento záväzok naplňal s patričnou vážnosťou a zodpovednosťou. V tejto aktivite ho Ústav anorganickej chémie bude podporovať.

Jednou z najvýznamnejších popularizačných aktivít ústavu sú „Korešpondenčné semináre z chémie a biológie pre stredné školy a seminár z prírodných vied pre základné školy“, ktoré sú organizované v rámci spoločného projektu ÚACH SAV (hlavný riešiteľ S. Kedžuch) a PríF UK. Je to súbor vedomostných súťaží, prebiehajúcich na celoštátnej úrovni, v rámci ktorých sa úlohy distribuujú na školy poštou (vo forme brožúr) alebo on-line formou (vo forme webovej aplikácie). Zadané úlohy sú zamerané na atraktívne a dynamicky sa rozvíjajúce oblasti biológie a chémie resp. na prírodovedné predmety základných škôl, pričom ich riešenie je zamerané na využitie kreatívneho a logického myslenia. V školskom roku 2012/2013 sa do súťaží zapojilo 5460 žiakov/študentov základných stredných škôl. Najúspešnejší žiaci/študenti boli pozvaní na odborné sústreďenie (z chémie, biológie a prírodných vied). V roku 2013 sa týchto sústreďení zúčastnilo 77 študentov. Okrem toho bolo vydaných 9 zborníkov súťažných úloh a učebný text pre odborné sústreďenie.

Dňa 14.11.2013 pripravil Ústav anorganickej chémie SAV v rámci Týždňa vedy a techniky na Slovensku „Deň otvorených dverí ÚACH SAV“, na ktorý boli prednostne pozvaní študenti stredných škôl zo Slovenska. Pre mladých návštevníkov bola pripravená prezentácia s názvom „Chémia v číslach“, počas ktorej sa mohli populárno-náučnou formou oboznámiť s možnosťou využitia výpočtov pri objasňovaní štruktúr niektorých zlúčenín. Prehliadka ústavu pre študentov potom pokračovala vo vybraných laboratóriách, kde im mladí vedecí pracovníci ÚACH SAV ukazovali zaujímavé prístroje, rozprávali o ich praktickom využití, prípadne im názorne toto praktické využitie prezentovali. Na mnohých stanovištiach im boli zároveň predvedené efektné a zaujímavé chemické experimenty. Zaujímavá prezentácia bola pre návštevníkov pripravená na skenovacom elektrónovom mikroskope. Dňa otvorených dverí sa zúčastnilo 205 študentov zo 7 bratislavských i mimobratislavských stredných škôl, ako i 20 študentov z UKF Nitra a PríF UK Bratislava.

10. Činnosť knižnično-informačného pracoviska

10.1. Knižničný fond

Tabuľka 10a Knižničný fond

| | | |
|--|---|------|
| Knižničné jednotky spolu | | 7513 |
| z toho | knihy a zviazané periodiká | 7513 |
| | audiovizuálne dokumenty | |
| | elektronické dokumenty (vrátane digitálnych) | |
| | mikroformy | |
| | iné špeciálne dokumenty - dizertácie, výskumné správy | |
| Počet titulov dochádzajúcich periodík | | 3 |
| z toho zahraničné periodiká | | 3 |
| Ročný prírastok knižničných jednotiek | | 12 |
| v tom | kúpou | 12 |
| | darom | |
| | výmenou | |
| | bezodplatným prevodom | |
| Úbytky knižničných jednotiek | | |
| Knižničné jednotky spracované automatizovane | | |

10.2. Výpožičky a služby

Tabuľka 10b Výpožičky a služby

| | | |
|----------------------------------|----------------------------------|----|
| Výpožičky spolu | | 65 |
| z toho | odborná literatúra pre dospelých | 7 |
| | výpožičky periodík | 55 |
| | prezenčné výpožičky | |
| MVS iným knižniciam | | 3 |
| MVS z iných knižníc | | |
| MMVS iným knižniciam | | |
| MMVS z iných knižníc | | |
| Počet vypracovaných bibliografií | | |
| Počet vypracovaných rešerší | | |

10.3. Používatelia

Tabuľka 10c Užívatelia

| | |
|---------------------------|--|
| Registrovaní používatelia | |
|---------------------------|--|

| | |
|--|----|
| Návštevníci knižnice spolu (bez návštevníkov podujatí) | 99 |
|--|----|

10.4. Iné údaje

Tabuľka 10d Iné údaje

| | |
|---|--------|
| On-line katalóg knižnice na internete (1=áno, 0=nie) | 0 |
| Náklady na nákup knižničného fondu v € | 761,18 |

10.5. Iné informácie o knižničnej činnosti

11. Aktivity v orgánoch SAV

11.1. Členstvo vo Výbore Snemu SAV

11.2. Členstvo v Predsedníctve SAV a vo Vedeckej rade SAV

prof. RNDr. Pavol Šajgalík, DrSc.

- člen VR SAV
- Podpredseda pre ekonomiku

11.3. Členstvo vo vedeckých kolégiách SAV

doc. Ing. Miroslav Boča, PhD.

- VK SAV pre chemické vedy (člen)

RNDr. Peter Komadel, DrSc.

- VK SAV pre chemické vedy (predseda)

RNDr. Jana Madejová, DrSc.

- VK SAV pre chemické vedy (člen)

prof. RNDr. Jozef Noga, DrSc.

- VK SAV pre chemické vedy (člen)

prof. RNDr. Pavol Šajgalík, DrSc.

- VK SAV pre chemické vedy (člen)

11.4. Členstvo v komisiách SAV

doc. Ing. Miroslav Boča, PhD.

- Komisia SAV pre infraštruktúru a štrukturálne fondy (člen)

prof. RNDr. Jozef Noga, DrSc.

- Komisia SAV pre spoluprácu s vysokými školami (člen)

prof. RNDr. Pavol Šajgalík, DrSc.

- Komisia SAV pre ekonomické otázky (predseda)

11.5. Členstvo v orgánoch VEGA

doc. Ing. Miroslav Boča, PhD.

- Komisia VEGA č. 3 pre chemické vedy, chemické inžinierstvo a biotechnológie (podpredseda)

doc. Ing. Zoltán Lenčéš, PhD.

- Komisia VEGA č. 7 pre strojárstvo a príbuzné odbory informačných a komunikačných technológií a materiálové inžinierstvo (člen)

RNDr. Jana Madejová, DrSc.

- Komisia VEGA č. 3 pre chemické vedy, chemické inžinierstvo a biotechnológie (člen)

Dr. Oľga Malkin, DrSc.

- Komisia VEGA č. 3 pre chemické vedy, chemické inžinierstvo a biotechnológie (člen)

12. Hospodárenie organizácie

12.1. Výdavky RO SAV

Tabuľka 12a Výdavky RO SAV (v €)

| V ý d a v k y | Skutočnosť k 31.12.2013 spolu | v tom: | | | |
|---|-------------------------------------|-----------|---|------------------------|--|
| | | zo ŠR | z toho: ŠF EÚ vr. spolufina n.zo ŠR | z mimorozp. zdrojov | z toho: ŠF EÚ vr. spolufinan.z o ŠR |
| Výdavky spolu | 2 391 304 | 1 599 988 | 553 730 | 791 316 | 247 985 |
| Bežné výdavky | 1 809 323 | 1 144 244 | 97 986 | 665 079 | 150 969 |
| v tom: | | | | | |
| mzdy (610) | 872 051 | 669 841 | 54 659 | 202 210 | 72 355 |
| poistné a príspevok do poisťovní (620) | 304 717 | 233 763 | 20 297 | 70 954 | 23 413 |
| tovary a služby (630) | 632 555 | 240 640 | 23 030 | 391 915 | 55 201 |
| z toho: časopisy | 2 376 | 947 | 0 | 1 429 | 0 |
| VEGA projekty | 114 270 | 114 270 | 0 | 0 | 0 |
| MVTS projekty | 44 287 | 44 287 | 0 | 0 | 0 |
| CE | 0 | 0 | 0 | 0 | 0 |
| vedecká výchova | 131 647 | 106 192 | 0 | 25 455 | 0 |
| bežné transfery (640) | 275 734 | 129 786 | 29 834 | 145 948 | 0 |
| z toho: štipendiá | 112 625 | 99 953 | 0 | 12 672 | 0 |
| transfery partnerom projektov | 150 327 | 29 834 | 29 834 | 120 493 | 0 |
| Kapitálové výdavky | 581 981 | 455 744 | 455 744 | 126 237 | 97 016 |
| v tom: | | | | | |
| obstarávanie kapitálových aktív | 242 581 | 116 344 | 83 196 | 126 237 | 97 016 |
| kapitálové transfery | 339 399 | 339 399 | 339 399 | 0 | 0 |
| z toho: transfery partnerom projektov | 339 399 | 339 399 | 339 399 | 0 | 0 |

12.2. Príjmy RO SAV

Tabuľka 12b Príjmy RO SAV (v €)

| P r í j m y | Skutočnosť k 31.12.2013 | v tom: | |
|-------------|----------------------------|------------|---|
| | | rozpočtové | z |

| | spolu | | mimoroz p. zdrojov |
|---|--------------|--------|-------------------------------|
| Príjmy spolu | 963 754 | 11 164 | 952 590 |
| Nedaňové príjmy | 963 754 | 11 164 | 952 590 |
| v tom: | | | |
| príjmy z prenájmu | 0 | 0 | 0 |
| príjmy z predaja výrobkov a služieb | 8 900 | 8 900 | 0 |
| iné | 954 854 | 2 264 | 952 590 |
| Granty a transfery (mimo zdroja 111) | 952 590 | 0 | 952 590 |
| v tom: | | | |
| tuzemské | 727 349 | 0 | 727 349 |
| z toho: APVV | 470 590 | 0 | 470 590 |
| iné | 256 759 | 0 | 256 759 |
| zahraničné | 225 241 | 0 | 225 241 |
| z toho: projekty rámcového programu EÚ | 178 846 | 0 | 178 846 |
| iné | 46 395 | 0 | 46 395 |

13. Nadácie a fondy pri organizácii SAV

14. Iné významné činnosti organizácie SAV

15. Vyznamenania, ocenenia a ceny udelené pracovníkom organizácie v roku 2013

15.1. Domáce ocenenia

15.1.1. Ocenenia SAV

Komadel Peter

Medaila špičkovému tímu ÚACH SAV pri príležitosti 60. výročia založenia SAV

Oceňovateľ: Predseda SAV

Opis: Vedúci tímu: P. Komadel, J. Bujdák, Členovia tímu: J. Madejová,, A. Czímerová, L. Jankovič, H. Pálková, S. Andrejkovičová, J. Hrachová, A. Čeklovský, M. Pentrák

Malkin Oľga

Medaila špičkovému tímu ÚACH SAV pri príležitosti 60. výročia založenia SAV

Oceňovateľ: Predseda SAV

Opis: Vedúci tímu: O.L. Malkina, J. Noga, V.G. Malkin, Členovia tímu: P. Hrobárik, S. Kedžuch, S. Komorovský, A. Křístková

Micháľková Monika

čestné uznanie zo „Súťaže mladých vedeckých pracovníkov SAV do 35 rokov“

Oceňovateľ: SAV

Opis: Ocenenie za 3 ročné výsledky práce a prezentovanie prednášky s názvom - Progresívne keramické materiály s výnimočnými vlastnosťami

Noga Jozef

Predseda Rady Učenej spoločnosti

Oceňovateľ: Valné zhromaždenie Učenej spoločnosti SAV

Opis: Na valnom zhromaždení Učenej spoločnosti SAV bola dňa 6.11.2013 zvolená nová Rada Učenej spoločnosti SAV, ktorej predsedom sa stal prof. RNDr. Jozef Noga, DrSc.

Šajgalík Pavol

Udelenie medaily nadpriemernému tímu ÚACH SAV pri príležitosti 60. výročia založenia SAV

Oceňovateľ: Predseda SAV

Opis: Vedúci tímu: P. Šajgalík, Členovia tímu: D. Galusek, K. Ghillayniová, M. Hnatko, Z. Lenčes, M. Micháľková, J. Sedláček

15.1.2. Iné domáce ocenenia

15.2. Medzinárodné ocenenia

Lenčes Zoltán

Fellow of the European Ceramic Society

Oceňovateľ: European Ceramic Society

Opis: Ocenenie vedeckej, pedagogickej a organizačnej činnosti špičkových vedcov z Európy

Šajgalík Pavol

Fellow of the European Ceramic Society

Oceňovateľ: European Ceramic Society

Opis: ocenenie vedeckej, pedagogickej a organizačnej činnosti špičkových vedcov z Európy

Šajgalík Pavol

Stujts Award of the European Ceramic Society

Oceňovateľ: European Ceramic Society (ECerS)

Opis: Najvyššie ocenenie vedca spoločnosťou ECerS za celoživotné výsledky dosiahnuté v oblasti výskumu keramických materiálov

16. Poskytovanie informácií v súlade so zákonom č. 211/2000 Z. z. o slobodnom prístupe k informáciám v znení neskorších predpisov (Zákon o slobode informácií)

17. Problémy a podnety pre činnosť SAV

Zásadný problém, ktorý narastá niekoľko rokov a v roku 2013 sa prejavil ešte výraznejšie, je absurdný nárast administratívnych nárokov na všetkých úrovniach. Dominuje im oblasť verejného obstarávania. Pre potreby naplnenia legislatívnych povinností ústavu v oblasti verejného obstarávania je jeden plný úväzok pre administratívneho pracovníka málo.

Navyše mzdové prostriedky ústavu neumožňujú rozšírenie administratívy ani o toho jedného pracovníka. Výsledkom je, že potrebnú aktivitu vykonáva približne 5 vedeckých pracovníkov nad rámec alebo na úkor svojich odborných aktivít. Táto situácia je absolútne neúnosná. Namiesto podpory prichádza od štátu ďalší úder v podobe krátenia rozpočtu, čo znamená prepustenie pracovníka, respektíve nepredĺženie pracovnej zmluvy zamestnancovi, čo sa stalo skutočnosťou v štyroch prípadoch koncom roku 2013 a bude pokračovať aj v roku 2014. Deklarovaná snaha PSAV pomôcť ústavom v tejto situácii je vítaná, ale stále nie je naplnená.

Jednou z možností, ako by mohlo Predsedníctvo pomôcť ústavom s prebujnelou administratívou je zabezpečiť poistenie majetku (hlavne z dôvodu požiadavky ASFEU) pre všetky ústavy centrálne, čo by výrazne ústavy odbremenilo a pravdepodobne by sa podarilo vyrokovať nižšie ceny na poistné zmluvy od jedného dodávateľa pre väčšie množstvo prístrojov.

Hlavnou pracovnou náplňou vedeckého pracovníka by mal byť výskum. Toto nie je možné naplniť minimálne z dvoch dôvodov. Prvým je už spomínaná abnormálna a nezmyselná administratívna záťaž vedeckých pracovníkov. Druhým je absencia skutočnej podpory vedy politickými špičkami.

V tomto sklamali všetky doterajšie vlády a parlamenty Slovenska. Fakty, ktoré hovoria o tom, že výzvy na podávanie projektov nebudú, svedčia len o tom, že reči politikov o podpore vedy sú len prázdne slová. V tejto situácii nevieme navrhnúť žiadne aktivity ako s týmto úspešne bojovať.

Nutnosť transformácie SAV je síce nespochybniteľná, ale sprievodné javy k tomuto procesu (problém ESA ako aktivita štátu vs. spájanie ústavov ako aktivita SAV) vyvolávajú množstvo otázok a pochybností. V tejto neprehľadnej situácii sa netreba čudovať absencii akejkolvek ochoty aktívne participovať na požadovaných zmenách. Ak je ústav oslovený, že sa má zapojiť do fúzných procesov, je potrebné k tejto výzve pripojiť aj veľmi konkrétne návrhy legislatívnych rámcov tejto zmeny. Doteraz používané argumenty napr. o náraste sily väčších celkov sa javia byť v rovine želaní a predpokladov. Nejasná situácia otvára priestor pre špekulácie, čo vedie následne k možno nepodloženým fámam a zneisťovaniu zamestnancov.

Správu o činnosti organizácie SAV spracoval(i):

RNDr. Jana Madejová, DrSc., 02/59410406

.....

Ing. Helena Pálková, PhD., 02/59410485

.....

Riaditeľ organizácie SAV:

.....

doc. Ing. Miroslav Boča, PhD.

Prílohy

Príloha A - Zoznam zamestnancov a doktorandov organizácie k 31.12.2013

Zoznam zamestnancov podľa štruktúry (nadväzne na údaje v Tabuľke 1a)

| | Meno s titulmi | Úväzok (v %) | Ročný prepočítaný úväzok |
|---|-----------------------------------|-----------------|-----------------------------|
| Vedúci vedeckí pracovníci DrSc. | | | |
| 1. | doc. RNDr. Juraj Bujdák, DrSc. | 50 | 0.50 |
| 2. | RNDr. Peter Komadel, DrSc. | 100 | 1.00 |
| 3. | prof. Ing. Marek Liška, DrSc. | 45 | 0.45 |
| 4. | RNDr. Jana Madejová, DrSc. | 100 | 1.00 |
| 5. | Dr. Oľga Malkin, DrSc. | 100 | 1.00 |
| 6. | Dr. Vladimír Malkin, DrSc. | 100 | 1.00 |
| 7. | prof. RNDr. Jozef Noga, DrSc. | 53 | 0.53 |
| 8. | prof. RNDr. Pavol Šajgalík, DrSc. | 55 | 0.78 |
| Vedúci vedeckí pracovníci CSc., PhD. | | | |
| 1. | doc. Ing. Miroslav Boča, PhD. | 100 | 1.00 |
| Samostatní vedeckí pracovníci | | | |
| 1. | doc. Ing. Tomáš Bučko, PhD. | 25 | 0.25 |
| 2. | Mgr. Adriana Czimerová, PhD. | 100 | 1.00 |
| 3. | doc. RNDr. Milan Drábik, CSc. | 50 | 0.50 |
| 4. | prof. Ing. Dušan Galusek, DrSc. | 55 | 0.55 |
| 5. | doc. Ing. Miroslav Hnatko, PhD. | 100 | 1.00 |
| 6. | Mgr. Ľuboš Jankovič, PhD. | 100 | 1.00 |
| 7. | Ing. Štefan Kavecký, CSc. | 33 | 0.33 |
| 8. | Mgr. Stanislav Kedžuch, PhD. | 100 | 1.00 |
| 9. | Ing. Róbert Klement, PhD. | 27 | 0.27 |
| 10. | Ing. Michal Korenko, PhD. | 100 | 1.00 |
| 11. | doc. Ing. Zoltán Lenčేశ, PhD. | 100 | 1.00 |
| 12. | doc. Ing. Pavel Mach, CSc. | 25 | 0.25 |
| 13. | Ing. Ivan Nerád, CSc. | 60 | 0.60 |
| 14. | Ing. Helena Pálková, PhD. | 100 | 1.00 |
| 15. | Ing. Jaroslav Sedláček, PhD. | 100 | 1.00 |
| 16. | Ing. Eva Scholtzová, CSc. | 100 | 1.00 |
| 17. | RNDr. Ľubomír Smrčok, CSc. | 100 | 1.00 |
| 18. | doc. Ing. Peter Šimurka, PhD. | 100 | 1.00 |

| | | | |
|--|---------------------------------|-----|------|
| 19. | Mgr. Peter Švančárek, PhD. | 100 | 1.00 |
| Vedeckí pracovníci | | | |
| 1. | James Richard Asher, PhD | 100 | 1.00 |
| 2. | Mgr. Anna Brtáňová, PhD. | 100 | 0.33 |
| 3. | Mgr. Alexander Čeklovský, PhD. | 100 | 1.00 |
| 4. | Ing. Marián Gall, PhD. | 80 | 0.33 |
| 5. | Mgr. Peter Hrobárik, PhD. | 0 | 0.00 |
| 6. | Ing. Branislav Hruška, PhD. | 100 | 0.33 |
| 7. | Ing. Mária Chromčíková, PhD. | 100 | 1.00 |
| 8. | Mgr. Stanislav Komorovský, PhD. | 0 | 0.00 |
| 9. | Ing. Jozef Kraxner, PhD. | 100 | 1.00 |
| 10. | Ing. Blanka Kubíková, PhD. | 100 | 1.00 |
| 11. | Ing. Marián Kucharík, PhD. | 0 | 0.00 |
| 12. | Ing. Monika Micháľková, PhD. | 70 | 0.40 |
| 13. | Ing. Jarmila Mlynáriková, PhD. | 100 | 1.00 |
| 14. | Ing. Zuzana Netriová, PhD. | 0 | 0.00 |
| 15. | Ing. Viliam Pavlík, PhD. | 100 | 1.00 |
| 16. | Ing. Martin Pentrák, PhD. | 0 | 0.00 |
| 17. | Ing. Linda Pentráková, PhD. | 0 | 0.00 |
| 18. | doc. Ing. Alfonz Plško, CSc. | 28 | 0.28 |
| 19. | Ing. Anna Prnová, PhD. | 100 | 1.00 |
| 20. | Mgr. Michal Repiský, PhD. | 0 | 0.00 |
| 21. | Ing. František Šimko, PhD. | 100 | 1.00 |
| 22. | Ing. Jana Valúchová, PhD. | 100 | 1.00 |
| 23. | Ing. Štefan Varga, CSc. | 100 | 1.00 |
| 24. | Ing. Zuzana Vasková, PhD. | 100 | 1.00 |
| 25. | Ing. Martin Vitkovič, PhD. | 100 | 1.00 |
| Odborní pracovníci s VŠ vzdelaním | | | |
| 1. | Mgr. Martina Bukovská | 100 | 1.00 |
| 2. | Mgr. Roman Bystrický | 20 | 0.20 |
| 3. | Ing. Katarína Faturíková, PhD. | 100 | 1.00 |
| 4. | prom.farm. Ľubica Gáliková | 100 | 1.00 |
| 5. | Ing. Veronika Gurišová | 100 | 1.00 |
| 6. | Ing. Eva Hadzimová | 100 | 1.00 |
| 7. | Ing. Tomáš Hanulík | 28 | 0.28 |

| | | | |
|-------------------------------|----------------------------|-----|------|
| 8. | Ing. Ingrid Hierwegová | 94 | 0.94 |
| 9. | Ing. Katarína Hlavačková | 80 | 0.80 |
| 10. | Ing. Monika Hrabalová | 100 | 1.00 |
| 11. | RNDr. Klára Hrnčiarová | 40 | 0.40 |
| 12. | MSc. Ismail Ibrahim | 100 | 1.00 |
| 13. | Ing. Hana Kaňková, PhD. | 20 | 0.20 |
| 14. | Ing. Ľubomír Koleda | 100 | 1.00 |
| 15. | Ing. Iveta Macková | 100 | 1.00 |
| 16. | Ing. Eva Mikšíková | 125 | 1.25 |
| 17. | Ing. Ján Piško | 100 | 1.00 |
| 18. | Ing. Jozef Priščák | 100 | 1.00 |
| 19. | Ing. Jaroslav Rusnák, PhD. | 33 | 0.33 |
| 20. | Bc. Bc. Marica Satinová | 100 | 0.50 |
| 21. | Ing. Zuzana Slobodová | 100 | 1.00 |
| 22. | Ing. Katarína Šovčíková | 40 | 0.40 |
| 23. | Ing. Jana Vokelová | 100 | 1.00 |
| Odborní pracovníci ÚSV | | | |
| 1. | Miroslav Baďura | 20 | 0.20 |
| 2. | Iveta Bouadjenak | 100 | 1.00 |
| 3. | Jaromíra Dankovičová | 125 | 1.25 |
| 4. | Jarmila Heinleinová | 100 | 1.00 |
| 5. | Miriám Hnatková | 100 | 1.00 |
| 6. | Anna Jurová | 100 | 1.00 |
| 7. | Magdaléna Kňazovičová | 100 | 1.00 |
| 8. | Anna Kovárová | 100 | 1.00 |
| 9. | Zora Lukáčová | 100 | 1.00 |
| 10. | Jozef Sitár | 100 | 1.00 |
| 11. | Anna Škumátová | 100 | 1.00 |
| 12. | Alexandra Tonkovičová | 50 | 0.50 |
| Ostatní pracovníci | | | |
| 1. | Dana Matejkinová | 100 | 1.00 |
| 2. | Terézia Pírová | 100 | 1.00 |

Zoznam zamestnancov, ktorí odišli v priebehu roka

| | Meno s titulmi | Dátum odchodu | Ročný prepočítaný úväzok |
|--|---------------------------------|---------------|--------------------------|
| Vedeckí pracovníci | | | |
| 1. | Ing. Katarína Bodišová, PhD. | 31.8.2013 | 0.66 |
| 2. | Ing. Františka Frajkorová, PhD. | 31.3.2013 | 0.00 |
| 3. | Ing. Dagmar Galusková, PhD. | 31.8.2013 | 0.08 |
| Odborní pracovníci s VŠ vzdelaním | | | |
| 1. | Mgr. Natália Jamrichová | 31.8.2013 | 0.66 |
| Odborní pracovníci ÚSV | | | |
| 1. | Zdena Kapišinská | 31.7.2013 | 0.58 |

Zoznam doktorandov

| | Meno s titulmi | Škola/fakulta | Študijný odbor |
|--|---------------------------|--|--|
| Interní doktorandi hradení z prostriedkov SAV | | | |
| 1. | Mgr. Valéria Bizovská | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| 2. | Mgr. Peter Boháč | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| 3. | Mgr. Roman Bystrický | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| 4. | Mgr. Magdaléna Domanická | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| 5. | Ing. Ondrej Hanzel | Fakulta chemickej a potravinárskej technológie STU | 5.2.19 anorganická technológia a materiály |
| 6. | Mgr. Marcela Hrdá | Prírodovedecká fakulta UK | 4.1.11 chemická fyzika |
| 7. | Marius Kadek | Prírodovedecká fakulta UK | 4.1.11 chemická fyzika |
| 8. | Mgr. Martin Kontrík | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| 9. | Mgr. Lukáš Petra | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| 10. | Ing. Samuel Sas | Fakulta chemickej a potravinárskej technológie STU | 5.2.19 anorganická technológia a materiály |
| 11. | Ing. Ľudmila Sekeráková | Fakulta chemickej a potravinárskej technológie STU | 5.2.19 anorganická technológia a materiály |
| 12. | Ing. Michal Šimurda | Fakulta chemickej a potravinárskej technológie STU | 5.2.19 anorganická technológia a materiály |
| 13. | Mgr. Michal Vetrecin | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |
| Interní doktorandi hradení z iných zdrojov | | | |
| 1. | Ing. Christina Atzenhofer | Montanuniversitaet Leoben, Rakúsko | |
| 2. | Ing. Monika Hrabalová | Vysoká škola báňská - TU Ostrava, Česká republika | |
| 3. | Peter John Cherry | Prírodovedecká fakulta UK | 4.1.11 chemická fyzika |
| 4. | Ismail Ibrahim | Prírodovedecká fakulta UK | 4.1.15 anorganická chémia |

| | | | |
|---------------------------|-------------------------|--|---|
| 5. | Ing. Vladana Šamajová | Vysoká škola báňská - TU Ostrava, Česká republika | |
| Externí doktorandi | | | |
| 1. | Ing. Katarína Müllerová | Fakulta chemickej a potravinárskej technológie STU | 5.2.19 anorganická technológia a materiály |

Príloha B - Projekty riešené v organizácii

Medzinárodné projekty

Programy: Medziakademická dohoda (MAD)

1.) Organo-ily ako medzistupeň pre prípravu nových hybridných materiálov s funkčnými vlastnosťami (*Organo-clays as intermediates for the synthesis of functional hybrid materials*)

| | |
|---|-------------------------------|
| Zodpovedný riešiteľ: | Helena Pálková |
| Trvanie projektu: | 1.1.2013 / 31.12.2015 |
| Evidenčné číslo projektu: | SAV-PAV 14 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 1 - Poľsko: 1 |
| Čerpané financie: | |

Dosiahnuté výsledky:

V prvom roku riešenia projektu sa uskutočnila základná charakterizácia rôznych ílových minerálov zo skupiny smektitov (prírodný montmorillonit SAz, SWy, syntetický hektorit Laponite RD, syntetický saponit Sumecton), ktoré boli/budú následne použité pri príprave rôznych hybridných materiálov. Montmorillonit SAz, sa modifikoval organickým fosfóniovým kationom a skúmala sa jeho stabilita v kyslom prostredí. Zmeny v štruktúre materiálu sa pozorovali použitím rôznych metód. Chemická analýza pevných produktov sa uskutočnila pomocou XRF, IČ spektroskopiou a röntgenovou difrakčnou analýzou sa sledovali štrukturálne zmeny vplyvom pôsobenia HCl. Na sledovanie množstva organického kationu sa využila termická analýza ako aj elementárna analýza uhlíka.

Zo syntetického ílového minerálu Laponitu a organického alkylamóniového kationu sa reakciou hydrolyzy ortosilikátu a následnou kalcináciou pripravil materiál s pórovitou štruktúrou, ktorý bol funkcionalizovaný dodaním hliníka do vzniknutej pórovitej siete SiO₂. Týmto postupom sa zvýšilo množstvo aktívnych centier a zvýšila sa katalytická aktivita materiálu v procese rozkladu etanolu.

Výstupy:

M. ZIMOWSKA, H. PÁLKOVÁ, J. MADEJOVÁ, R. DULA, K. PAMIN, Z. OLEJNICZAK, B. GIL, E.M. SERWICKA, Laponite-derived porous clay heterostructures: III. The effect of alumination. In Microporous and Mesoporous Materials, 2013, vol. 175, p. 67-75.

M. ZIMOWSKA, H. PÁLKOVÁ, J. MADEJOVÁ, Z. OLEJNICZAK, E.M. SERWICKA, FTIR and mass NMR (27Al, 29Si) as complementary methods in the study of aluminated porous heterostructures (PCH) derived from laponite. XV International Clay Conference Rio de Janeiro, Brazil, 7-11 July, 2013, Universidade Federal do Rio de Janeiro, 2013

Programy: Medzivládna dohoda

2.) Nové anorganické fosfory bez obsahu prvkov vzácnych zemín pre energeticky úsporné osvetľovacie zdroje (*New rare earth-free inorganic phosphors for energy-saving lighting applications*)

| | |
|---|---|
| Zodpovedný riešiteľ: | Dušan Galusek |
| Trvanie projektu: | 1.1.2013 / 31.12.2015 |
| Evidenčné číslo projektu: | SAS-NSC JRP 2012/14 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 2 - Taiwan: 2 |
| Čerpané financie: | Podpora medzinárodnej spolupráce z národných zdrojov: 22000 € |

Dosiahnuté výsledky:

Metóda prípravy sklených mikroguličiek plameňovou syntézou sa využila na prípravu celého radu skiel v kvázibinárnych a kváziternárnych systémoch $\text{Al}_2\text{O}_3\text{-RE}_2\text{O}_3$, $\text{Al}_2\text{O}_3\text{-Re}_2\text{O}_3\text{-MexOy}$, $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$ a ZnO-SiO_2 , kde RE = La, Y, Yb, a Me = Si, Zr ako prísady zvyšujúcu sklotvornosť systému. Tieto sklá sa dopovali opticky aktívnymi prísadami (aktivátormi) Er, Nd, Eu, Mn zabezpečujúcimi emisiu vo viditeľnej oblasti spektra. Na základe výsledkov štúdia kinetiky kryštalizácie pripravených hlinitanových skiel pomocou diferenciálnej skenovacej kalorimetrie kombinovanej s vysokoteplotnou RTG difrakciou sa získali údaje pre optimalizáciu teplotného režimu pre nukleáciu a kryštalizáciu nanokryštalických aluminátov, pričom sa vo viacerých systémoch preskúmal vplyv zloženia materského skla a stupňa kryštalizácie na intenzitu a vlnovú dĺžku emitovaného žiarenia.

Výstupy projektu:

- 1/ DOMANICKÁ A., KLEMENT R., PRNOVÁ A., BODIŠOVÁ K., GALUSEK D., Luminescent rare-earth ions doped $\text{Al}_2\text{O}_3\text{-Y}_2\text{O}_3\text{-SiO}_2$ glass microspheres prepared by flame synthesis, *Ceramics International*, prijaté do tlače
- 2/ PRNOVÁ A., BODIŠOVÁ K., KLEMENT R., MIGÁT M., VETEŠKA, ŠKRÁTEK M., BRUNEEL E., VAN DRIESSE I., GALUSEK D. Preparation and characterization of $\text{Yb}_2\text{O}_3 - \text{Al}_2\text{O}_3$ glasses by the Pechini sol-gel method combined with flame synthesis, *Ceramics International*, prijaté do tlače
- 3/ HALADEJOVÁ K., KLEMENT R., BODIŠOVÁ K., PRNOVÁ A., GALUSEK D., Photoluminescence and up-conversion luminescence of $\text{Er}^{3+}/\text{Yb}^{3+}$ co-doped low silica yttrium aluminosilicate glasses, *Proc. of the 10th International Conference „Preparation of ceramic materials“*, Herľany, Slovakia, June 18.-20, 2013, pp. 82-83.
- 4/ DOMANICKÁ A., PRNOVÁ A., MIGÁT M., BODIŠOVÁ K., GALUSEK D., In-Situ Study of Crystallization of Er- And Nd-doped Yttrium Aluminosilicate Glasses, *Proc. of the 10th International Conference „Preparation of ceramic materials“*, Herľany, Slovakia, June 18.-20, 2013, pp. 82-83.
- 5/ ŠVANČAREK P., KLEMENT R., GALUSEK D., Photoluminescence Properties of $(\text{ZnO})\text{X-Z}(\text{SiO}_2)\text{Y}:(\text{MnO})\text{Z}$ Prepared by Direct Thermal Synthesis, *Proc. of the 10th International Conference „Preparation of ceramic materials“*, Herľany, Slovakia, June 18.-20, 2013, pp. 94-95.
- 6/ PRNOVÁ A., KLEMENT R., GALUSEK D., BODIŠOVÁ K., POLOVKA M., MIGÁT M., HRUŠKA B. Optical Properties of Nd^{3+} and Er^{3+} Doped Yttrium Aluminate Glasses with Different Amounts of Dopants, *Proc. of the 10th International Conference „Preparation of ceramic materials“*, Herľany, Slovakia, June 18.-20, 2013, pp. 130-131.
- 7/ HRUŠKA B., KLEMENT R., BODIŠOVÁ K., PRNOVÁ A., GALUSEK D., Preparation and properties of glasses in the system $\text{Al}_2\text{O}_3\text{-Y}_2\text{O}_3\text{-ZrO}_2$, *Proc. of the 10th International Conference „Preparation of ceramic materials“*, Herľany, Slovakia, June 18.-20, 2013, pp. 132-133.
- 8/ PRNOVÁ A., KLEMENT R., BODIŠOVÁ K., GALUSEK D., MIGÁT M., BRUNEEL E., VAN DRIESSE I. Study of thermal behaviour of yttrium-aluminate glasses by DSC and high temperature XRD analysis. In *Joint Czech-Hungarian-Polish-Slovak Thermoanalytical Conference*, book of Contributions, University of Pardubice, 24-27 June 2013, Eds. Dohnalová, Ž., Gorodyová, N., Šulcová, p. 175-178
- 9/ PRNOVÁ A., BODIŠOVÁ K., ŠKRÁTEK M., KLEMENT R., MIGÁT M., VETEŠKA P., GALUSEK D., BRUNEEL E., VAN DRIESSE I. Preliminary study of thermal properties of $\text{Al}_2\text{O}_3\text{-Yb}_2\text{O}_3$ glass microspheres. In *MEASUREMENT 2013*, 9th International Conference on Measurement. Editors J. Maňka, M. Tyšler, V. Witkovský, I. Frollo, Bratislava, Institute of Measurement Science, SAS, 2013, p. 327-330

3.) Termodynamické modely a štruktúra viaczložkových skiel (*Thermodynamic models and structure of multi-component glasses*)

Zodpovedný riešiteľ:

Mária Chromčíková

Trvanie projektu:

1.1.2012 / 31.12.2013

Evidenčné číslo projektu:

SK-CZ-0007-11

Organizácia je koordinátorom projektu:

áno

Koordinátor:

Ústav anorganickej chémie SAV

Počet spoluriešiteľských inštitúcií:

1 - Česko: 1

Čerpané financie:

Podpora medzinárodnej spolupráce z národných zdrojov: 2000 €

Dosiahnuté výsledky:

Prínosom spolupráce bola spoločná realizácia vedeckovýskumných aktivít, ktoré vyústili do spoločnej prezentácie výsledkov na medzinárodných konferenciách a v príprave spoločných publikácií pre prevažne zahraničné karentované časopisy.

- 1/ CHOVANEC J., CHROMČÍKOVÁ, M., PILNÝ P., SHÁNĚLOVÁ J., MÁLEK J., LIŠKA, M., As_2Se_3 melt

crystallization studied by quadratic approximation of nucleation and growth rate temperature dependence. In Journal of Thermal Analysis and Calorimetry, 2013, p. 1-7.

2/ CHROMČIKOVÁ M., LIŠKA, M., LISSOVÁ M., MOŠNER P., KOUDELKA L., Structural relaxation of PbO-WO₃-P₂O₅ glasses. In Journal of Thermal Analysis and Calorimetry, 2013, p. 1-8.

4.) Kvantovo-chemické výpočty magnetických vlastností rôznych chemických zlúčenín so zahrnutím relativistických efektov (*Quantum-chemical calculations of magnetic properties of various chemical compounds with inclusion of relativistic effects*)

| | |
|---|--|
| Zodpovedný riešiteľ: | Vladimír Malkin |
| Trvanie projektu: | 1.1.2012 / 31.12.2013 |
| Evidenčné číslo projektu: | SK-FR-0018-11 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 1 - Francúzsko: 1 |
| Čerpané financie: | Podpora medzinárodnej spolupráce z národných zdrojov: 1977 € |

Dosiahnuté výsledky:

Študovali sme vplyv asymetrie g-tenzora na interpretáciu experimentálnych EPR spektier. Podľa našich vedomostí, väčšina experimentálnej EPR komunity si nie je vedomá týchto efektov a pri interpretácii EPR spektier predpokladajú jeho symetriu, čo môže viesť k strate presnosti.

MALKIN O., MALKIN V.G., "On the analysis of EPR spectra: Do we loose anything working with the G-tensor instead of the g-tensor?", to be submitted to the Journal of Physical Chemistry.

5.) Vývoj kompozitných keramických materiálov pre bioaplikácie (*Development of ceramics composites materials for bio-applications.*)

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|---|--|
| Zodpovedný riešiteľ: | Pavol Šajgalík |
| Trvanie projektu: | 1.9.2013 / 31.12.2016 |
| Evidenčné číslo projektu: | SAS - TUBITAK JRP 2013/02 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 1 - Turecko: 1 |
| Čerpané financie: | Podpora medzinárodnej spolupráce z národných zdrojov: 4000 € |

Dosiahnuté výsledky:

Projekt je vo svojej počiatočnej fáze svojho riešenia. V rámci uplynulého obdobia prebehli prípravné práce v oblasti vývoja procesu prípravy pórovitej keramickej matrice na báze nitridu kremičitého. Okrem toho sme sa venovali príprave hydroxyapatitu (HA) metódou sól-gél, ktorý uľahčuje proces prijatia implantátu.

Programy: 7RP

6.) Pokrok vo vývoji a aplikáciách balíka NMR spektroskopie pre paramagnetické systémy. Kominovaný experimentálno-teoretický prístup (pNMR) (*Pushing the envelope of nuclear magnetic resonance spectroscopy for paramagnetic systems. A combined experimental a theoretical approach (pNMR)*)

| | |
|-----------------------------|-----------------|
| Zodpovedný riešiteľ: | Vladimír Malkin |
|-----------------------------|-----------------|

Trvanie projektu: 1.1.2013 / 31.12.2016
Evidenčné číslo projektu: PITN-GA-2012-317127
Organizácia je koordinátorom projektu: nie
Koordinátor: Centre Europeen de RMN a Tres Hauts Champs
Počet spoluriešiteľských inštitúcií: 10 - Nemecko: 2, Fínsko: 1, Francúzsko: 1, Veľká Británia: 1, Švajčiarsko: 1, Taliansko: 2, Holandsko: 1, Švédsko: 1
Čerpané financie: EU: 20150 €
Podpora medzinárodnej spolupráce z národných zdrojov: 6393 €

Dosiahnuté výsledky:

Vyvinuli sme novú relativistickú metódu založenú na Diracovej-Kohnovej-Shamovej rovnici pre výpočty NMR konštant tienenia paramagnetických dubletových systémov. Vyhodnotenie pNMR tenzorov sa redukuje na relativistický výpočet elektrónových g-tenzorov a NMR tenzorov tienenia. Skúšobné výpočty pre komplexy Ru(III) ukazujú dobrý výkon metódy pri reprodukovani experimentálnych výsledkov a v aplikovateľnosti pre štúdium chemicky relevantných systémov strednej veľkosti.

KOMOROVSKÝ S., REPISKÝ M., RUUD K., MALKINA O., MALKIN V., Four-component relativistic density functional theory calculations of NMR shielding tensors for paramagnetic systems. In Journal of Physical Chemistry A. Molecules, spectroscopy, kinetics, environment, and general theory, 2013, vol. 117, no. 51, p. 14209-14219.

7.) Nitridové materiály s funkčnými vlastnosťami pre aplikácie v energetike (*Functional nitrides for energy applications*)

Zodpovedný riešiteľ: Pavol Šajgalík
Trvanie projektu: 1.1.2011 / 31.12.2014
Evidenčné číslo projektu: 264873
Organizácia je koordinátorom projektu: nie
Koordinátor: Technische Universität Darmstadt
Počet spoluriešiteľských inštitúcií: 9 - Nemecko: 3, Francúzsko: 2, Taliansko: 2, Švédsko: 1, Turecko: 1
Čerpané financie: EU: 158696 €
Podpora medzinárodnej spolupráce z národných zdrojov: 11894 €

Dosiahnuté výsledky:

Nitridáciou zmesí Mg₂Si (alebo LaSi), Si a Si₃N₄ boli pripravené svetlo emitujúce luminofoxy na báze MgSiN₂ a LaSi₃N₅ dopovaných oxidmi kovov vzácnych zemín: Eu₂O₃, Sm₂O₃ a CeO₂. Riešiteľský kolektív úspešne zvládol optimalizáciu prípravy luminoforov na báze ternárnych nitridov. Boli pripravené aj luminofoxy na báze SiAlONu z polymérneho prekursoru. Optimalizáciou teplotného a plynového režimu syntézy luminoforov ako aj reguláciou obsahu dopantov (Eu, Sm, Ce) sa podarilo pripraviť keramické luminiscenčné materiály emitujúce modré, zelené, oranžové a červené svetlo – v závislosti od typu nitridu/oxynitridu a dopantu. Kombináciou monochromatických luminoforom možno pripraviť biele svetlo emitujúce diódy (LED).

Teoretickými výpočtami (metódou HSE06) boli stanovené šírky zakázaného pásu čistého ako aj dopovaného LaSi₃N₅, v dobrej zhode s experimentálnymi údajmi.

Výstupy:

1/ IBRAHIM I., LENČEŠ Z., BENCO Ľ., HRABALOVÁ M., ŠAJGALÍK P., Cerium-doped LaSi₃N₅: computed electronic structure and band gaps. J. Eur. Ceram. Soc., prijaté do tlače, Ref. No.: JECS-9492, DOI: 10.1016/j.jeurceramsoc.2013.12.054.

2/ IBRAHIM I., LENČEŠ Z., BENCO Ľ., HRABALOVÁ M., ŠAJGALÍK P., Samarium-doped LaSi₃N₅: synthesis, computed electronic structure and band gaps. J. Am. Ceram. Soc., odoslané do tlače, Ref. No. JACERS-34339.

3/ HRABALOVÁ M., LENČEŠ Z., CZÍMEROVÁ A., ŠAJGALÍK P., Luminofoxy na bázi LaSi₃N₅ dopované prvky vzácnych zemín. In Príprava a vlastnosti progresívnych keramických materiálov, odborný seminár, 18.-19. november 2013, zborník rozšírených abstraktov, Bratislava Ústav anorganickej chémie SAV, 2013, p. 29-31

4/ IBRAHIM I., LENČEŠ Z., BENCO Ľ., ŠAJGALÍK P., Samarium-doped LaSi₃N₅: computed electronic structure and band gaps. In Príprava a vlastnosti progresívnych keramických materiálov, odborný seminár, 18.-19. november 2013, zborník rozšírených abstraktov, Bratislava Ústav anorganickej chémie SAV, 2013, p. 35-37

5/ LENČEŠ Z., HRABALOVÁ M., IBRAHIM I., BENCO Ľ., ŠAJGALÍK P., HIRAO K., Influence of Eu, Ce and Sm dopants on the electronic structure and photoluminescence of MgSiN₂ and LaSi₃N₅-based phosphors. In ACTSEA

2013, 4th International symposium on advanced ceramics and technology, November 10-13, 2013, Taipei, Taiwan, 2013, p. 88-89.

6/ ŠAJGALÍK P., LENČEŠ Z., MICHÁLKOVÁ M., ZHOU Y., HIRAO K., Ternary silicon nitrides - from engineering to phosphors. In ACTSEA 2013, 4th International Symposium on Advanced Ceramics and Technology, November 10-13, 2013, Taipei, Taiwan, 2013, p. 84-85.

7/ HRABALOVÁ M., JONŠTA Z., LENČEŠ Z., Rare earth-doped lanthanum silicon nitride-based phosphors. Den doktorandů 2013, VŠB TU Ostrava, 8.12. 2013, Vydal: VŠB TU Ostrava, Poruba, Czech Republic, ISBN 978-80-248-3248-7, p. 67-70.

8/ ŠAJGALÍK P., LENČEŠ Z., "Svetlo a svietenie inak – výskum luminofórov na Ústave anorganickej chémie SAV", Quark, 2013, p. 20-21.

Programy: Bilaterálne - iné

8.) Alternatívne materiály a zariadenia pre komponenty do púmp (*Alternative Werkstoffe für Pumpenkomponenten*)

| | |
|---|-------------------------------|
| Zodpovedný riešiteľ: | Milan Drábik |
| Trvanie projektu: | 1.2.2011 / 31.12.2013 |
| Evidenčné číslo projektu: | |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 3 - Rakúsko: 3 |
| Čerpané financie: | Iné zdroje: 7660 € |

Dosiahnuté výsledky:

Mechanochemická aktivácia surovín vo vysokoenergetickom guľovom mlyne počas 5 minút je navrhnutá ako špecifický stupeň miešania a aktivácie v priebehu MDF syntézy, pričom uvedený proces zefektívňuje priebeh samotných reakcií tvorby MDF materiálov pod tlakom a pri použití špecifických spôsobov miešania. Výsledky jednoznačne ukazujú, že aktivácia je spôsobená mechanochemickým mechanizmom a spočíva v iniciácii a tvorbe merateľného množstva (do 30 %) Al(Fe)-O-P sietí už v spracovávaných surovinách. Výsledky, spôsob a rozsah ich publikovania predstavujú významný podiel pre riešenie relevantných WP projektu.

Výstupy:

1/ DRÁBIK M., GÁLIKOVÁ E., BILLIK P., MAIER G., KOSEDNAR-LEGENSTEIN B., Macro defect free materials; mechanochemical activation of raw mixes as the intensifying tool of the entire MDF synthesis. In Ceramics-Silikáty, 2013, vol. 57, no. 2, p. 120-125

2/ DRÁBIK M., BILLIK P., MAIER G. Macro defect free (MDF) materials; review on the recent developments. In New Trends in Coordination, Bioinorganic, and Applied Inorganic Chemistry.XXIV. International Conference on Coordination and Bioinorganic Chemistry, Smolenice Castle, Slovakia, June 2 - 7, 2013. Eds. Milan Melník, Peter Segľa, Miroslav Tatarko. - Bratislava : Press of Slovak University of Technology, 2013, p. 20-31.

3/ DRÁBIK M., GÁLIKOVÁ E., KOSEDNAR-LEGENSTEIN B., MAIER G., The recent developments in the field of macrodefect free (Mdf) materials. In IUPAC 2013 : 44th World Chemistry Congress : Istanbul, Turkey, 11 - 16 August 2013 : abstract book. - Istanbul, Turkey : Turkish Chemical Society, 2013, p. 964.

4/ DRÁBIK M., GÁLIKOVÁ E., KOSEDNAR-LEGENSTEIN B., MAIER G., The recent developments in the field of macrodefect free (MDF) materials. In 15. Österreichische Chemietage (15th Austrian Chemistry Days) : Graz, Austria, September 23 - 26, 2013. - Graz, Austria : Graz University of Technology, 2013, abstract no. 107.

5/ DRÁBIK M., GÁLIKOVÁ E., KOSEDNAR-LEGENSTEIN B., MAIER G., Najnovší vývoj v oblasti makro-defekt-free (MDF) materiálov (prehľad). In ChemZi : slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel : 65. Zjazd chemikov : Tatranské Matliare : 9. - 13. 9. 2013, roč. 9, č. 1, s. 171.

9.) Fyzikálno-chemická analýza fluoridových taveninových systémov pre elektrolytické vylučovanie kremíka pre fotovoltacké aplikácie (*Physico-chemical analysis of molten fluoride systems for electrowining of solar grade silicon*)

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| Zodpovedný riešiteľ: | Michal Korenko |
| Trvanie projektu: | 1.6.2013 / 31.12.2014 |

Evidenčné číslo projektu: SK-CN-0029-12
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 1 - Čína: 1
Čerpané financie: Podpora medzinárodnej spolupráce z národných zdrojov: 635 €

10.) Keramické nanokompozity pre aplikácie v extrémnych prostrediach (*Ceramic Nanocomposites for Applications in Extreme Environments*)

Zodpovedný riešiteľ: Pavol Šajgalík
Trvanie projektu: 1.1.2012 / 31.12.2013
Evidenčné číslo projektu: DAAD/SAV 54440408
Organizácia je koordinátorom projektu: nie
Koordinátor: Materialwissenschaft Technische Universität Darmstadt
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie:

Dosiahnuté výsledky:

V rámci projektu boli pripravené sól-gél metódou polymérne prekursorov na báze SiAlOC, SiHfOC a SiLuOC zo zmesi poly-metylsilsesquioxánu a alkoxidu daného kovu (Al, Hf, Lu), ktoré boli použité ako prísady spekania na zhutnenie Si₃N₄ keramiky. Prísady boli buď pyrolyzované, alebo iba zosieťované (crosslinking) pred použitím ako prísady spekania. Výsledky žiarového lisovania Si₃N₄ vzoriek s s prísadou prekursoru v množstve 15 – 40 hm.% ukázali, že je výhodnejšie použiť iba zosieťovaný prekursor, nakoľko boli dosiahnuté vyššie hustoty spekaných vzoriek. Ďalšou výhodou použitia organokovových prekursorov ako spekacích prísad je možnosť použitia kratšieho času spekania vzoriek (15 min vs 60 min u „klasických“ prísadách spekania) pri vysokých teplotách (1700 – 1800 °C). Mechanické vlastnosti Si₃N₄ vzoriek boli porovnateľné s vlastnosťami keramických materiálov pripravených s použitím „klasických“ oxidov ako prísad spekania, avšak boli zhutnené v priebehu kratšieho času výdrže a pri nižších teplotách spekania. Korózne testy keramických kompozitov (SiAlONov) vo vode alebo roztokoch chloridov pri zvýšených teplotách dokázali ich lepšiu odolnosť v porovnaní s „klasickými“ keramickými kompozitmi na báze Si₃N₄. Bola testovaná aj obrobitelnosť kompozitu Si₃N₄ – SiAlOC po nízkoteplotnej pyrolýze (500 °C). Výsledky ukázali, že materiál možno opracovávať sústruhom do požadovaných tvarov. Znížia sa tým náklady na finančne veľmi náročné opracovávanie keramických kompozitov, ktorá je možná iba diamantovými nástrojmi.

Publikácie:

VETRECI M., LENČEŠ Z., ŠAJGALÍK P., Machinable silicon nitride-based composites sintered with polymer derived ceramics as sintering additives. In SM 2013, COST SIMUFER. Conference for young scientists in ceramics : 10th students' meeting and 3rd ESR COST MP0904 workshop, Novi Sad, Serbia, november 6-9, 2013, p. 84-85.

Projekty národných agentúr

Programy: VEGA

1.) Roztavené fluoridové systémy pre vysokoteplotné aplikácie s potenciálom využitia v energetickom sektore (*Molten fluoride systems for high temperature applications with potential in energy sector application*)

Zodpovedný riešiteľ: Miroslav Boča
Trvanie projektu: 1.1.2012 / 31.12.2015
Evidenčné číslo projektu: 2/0095/12
Organizácia je koordinátorom projektu: áno

Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 22868 €

Dosiahnuté výsledky:

- 1/ KORENKO M., STRAKA M., SZATMÁRY L., AMBROVÁ M., UHLÍŘ, J. Electrochemical separation of uranium in the molten system LiF-NaF-KF-UF₄. In Journal of Nuclear Materials, 2013, vol. 440, p. 332-337
- 2/ KUBÍKOVÁ B. MACKOVÁ I., BOČA M., Phase analysis and volume properties of the (LiF-NaF-KF)_{eut}-K₂ZrF₆ system. In Monatshefte für Chemie, 2013, vol. 144, p. 295-300.
- 3/ NERÁD I., MIKŠÍKOVÁ E., KOSA L., ADAMKOVIČOVÁ K., Premelting at fusion of titanite CaTiSiO₅: a calorimetric study. In Physics and Chemistry of Minerals, 2013, vol. 40, no. 7, p. 597-602
- 4/ KORENKO M., PRIŠČÁK J., ŠIMKO F., Electrical conductivity of the systems based on Na₃AlF₆-SiO₂ melt. In Chemical Papers, 2013, vol. 67, no. 10, p. 1350-1354.
- 5/ STRAKA M., SZATMÁRY L., MAREČEK M., KORENKO M., Uranium recovery from LiF-CaF₂-UF₄-GdF₃ system on Ni electrode. In Journal of radioanalytical and nuclear chemistry, 2013, vol. 298, no. 1, p. 393-397
- 6/ KONTRÍK M., ŠIMKO F., Korózia TiB₂ v tavenine KF-AlF₃ s prídavkom Al₂O₃. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013 : zborník príspevkov. Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 87-94
- 7/ PAVLÍK V., KONTRÍK M., BOČA M., Vplyv prídavkov vybraných fluoridov na koróziu zliatiny Incoloy 800H/HT v tavenine (LiF-NaF-KF)_{eut}. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013, zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 103-111
- 8/ ŠIMURDA M., KORENKO M., Príprava hlboko podchladených fluoridových tavenín pomocou technik RSP. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013 : zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 79-86
- 9/ BOČA M. X-ray photoelectron spectroscopy of inorganic fluorides. In 17th ESFC - Paris 2013. 17th european symposium on fluorine chemistry, july 21-25, 2013, book of abstracts, 2013, p. 272

2.) Hybridné materiály vrstevnatých kremičitanov s kyanínovými a porfyrínovými farbivami
(Hybrid materials based on layered silicates with cyanine and porphyrine dyes)

Zodpovedný riešiteľ: Adriana Czímerová
Trvanie projektu: 1.1.2013 / 31.12.2016
Evidenčné číslo projektu: 2/0107/13
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 11496 €

Dosiahnuté výsledky:

Projekt sa nachádza vo svojej prvej etape riešenia. Urobil sa výber a základná charakterizácia ílových minerálov ako aj farbív – kyanínových aj porfyrínových farbív. Boli pripravené aj prvé typy hybridných materiálov na báze vybraných ílových minerálov a fotoaktívnych farbív. Pri týchto pilotných experimentoch sme sa zamerali hlavne na potlačenie nežiadúcej agregácie farbív. Ako surfaktant sme použili polymérny materiál a naše výsledky sú veľmi zaujímavé. Pomocou modifikácie povrchu ílového minerálu s polymérom sme potlačili agregáciu a výsledný hybridný materiál vykazuje veľmi dobré fluorescenčné vlastnosti. Navyše bol pripravený systém na štúdium prenosu energie medzi kyanínovými farbivami na povrchu ílového minerálu. Fluorescenčnou spektroskopiou bol dokázaný rezonančný prenos energie v koloidoch ílového minerálu tak v prípade sústav s dvomi farbivami ako aj dvojstupňový proces v prípade sústav s tromi farbivami. Prenos energie v koloidných sústavách nastáva v dôsledku koncentrácie molekúl farbív na povrchu častíc smektitu a prekryvu emisného spektra donora a absorpčného spektra akceptora energie.

Výsledky sú zhrnuté v prácach:

- 1/ CZÍMEROVÁ A., JANKOVIČ L., MADEJOVÁ J., ČEKLOVSKÝ A., Unique photoactive nanocomposites based on rhodamine 6G/polymer/montmorillonite hybrid systems. In Journal of Polymer Science. Part B.Polymer Physics, 2013, vol. 51, p. 1672-1679.
- 2/ ČEKLOVSKÝ A., TAKAGI S., Oxygen sensing materials based on clay/metalloporphyrin hybrid systems. In Central European Journal of Chemistry, 2013, vol. 11, no. 7, p. 1132-1136.

3.) Chémia ako „pridaná hodnota“ v poznávaní a vývoji i) pórobetónov novej generácie a ii) materiálov bez makrodefektov (MDF materiálov). (*The added value of chemistry for the knowledge and development of i) novel autoclaved aerated concrete and ii) macrodefectfree (MDF) materials.*)

Zodpovedný riešiteľ: Milan Drábik
Trvanie projektu: 1.1.2011 / 31.12.2013
Evidenčné číslo projektu: 2/0020/11
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 2195 €

Dosiahnuté výsledky:

Výsledky projektu predstavujú originálny príspevok k poznatkom o MDF materiáloch, predovšetkým v oblasti overovania a definovania účinku mechanochemickej predúpravy surovín na priebeh sieťovacích interakcií funkčných skupín polymérov s povrchom zŕn cementu. Rozsah sieťovania bol v aktivovaných surovinách ako aj v samotných MDF materiáloch identifikovaný tromi nezávislými experimentálnymi metódami (termická analýza, NMR spektroskopia, IČ spektroskopia). Aktivácia spôsobená mechanochemickým procesom vo vysokoenergetickom guľovom mlyne počas 5 minút spočíva v iniciácii a tvorbe merateľného množstva (do 30 %) Al(Fe)–O–P sietí už v spracovávaných surovinách.

1/ DRÁBIK M., BILLIK P., GÁLIKOVÁ E., Macro defect free materials; The challenge of mechanochemical activation. In *Ceramics-Silikáty*, 2012, vol. 56, no. 4, p. 396-401 (vyšlo v r. 2013)

2/ DRÁBIK M., GÁLIKOVÁ E., BILLIK P., MAIER, G., KOSEDNAR-LEGENSTEIN B., Macro defect free materials; mechanochemical activation of raw mixes as the intensifying tool of the entire MDF synthesis. In *Ceramics-Silikáty*, 2013, vol. 57, no. 2, p. 120-125.

3/ DRÁBIK M., BILLIK P., MAIER G., Macro defect free (MDF) materials; review on the recent developments. In *New Trends in Coordination, Bioinorganic, and Applied Inorganic Chemistry.XXIV. International Conference on Coordination and Bioinorganic Chemistry*, Smolenice Castle, Slovakia, June 2 - 7, 2013. Eds. Milan Melník, Peter Segľa, Miroslav Tatarko. - Bratislava: Press of Slovak University of Technology, 2013, p. 20-31.

4/ DRÁBIK M., GÁLIKOVÁ E., KOSEDNAR-LEGENSTEIN B., MAIER G., The recent developments in the field of macrodefect free (Mdf) materials. In *IUPAC 2013: 44th World Chemistry Congress: Istanbul, Turkey, 11 - 16 August 2013*, Turkish Chemical Society, 2013, p. 964.

5/ DRÁBIK M., GÁLIKOVÁ E., KOSEDNAR-LEGENSTEIN B., MAIER G., The recent developments in the field of macrodefect free (MDF) materials. In *15. Österreichische Chemietage (15th Austrian Chemistry Days): Graz, Austria, September 23 - 26, 2013*, Austria: Graz University of Technology, 2013, abstract no. 107.

6/ DRÁBIK M., GÁLIKOVÁ E., KOSEDNAR-LEGENSTEIN B., MAIER G., Najnovší vývoj v oblasti makro-defekt-free (MDF) materiálov (prehľad) In *ChemZi: slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel*: 65. Zjazd chemikov, Tatranské Matliare: 9. - 13. 9. 2013, roč. 9, č. 1, s. 171.

4.) Štruktúra a vlastnosti oxidových skiel – molekulová dynamika, termodynamické modely, kryštalizácia, vibračné a impedančné spektrá (*Structure and properties of oxide glasses – molecular dynamics, thermodynamic models, crystallization, vibrational and impedance spectroscopy*)

Zodpovedný riešiteľ: Mária Chromčíková
Trvanie projektu: 1.1.2012 / 31.12.2015
Evidenčné číslo projektu: 1/0006/12
Organizácia je koordinátorom projektu: nie
Koordinátor: Trenčianska univerzita Alexandra Dubčeka
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 620 €

Dosiahnuté výsledky:

Kryštalizácie kremičitanových skiel boli skúmané termickými metódami DTA a DSC. Termodynamické modely sa

konfrontovali s výsledkami experimentov a molekulovodynamických simulácií. Experimentálne sa stanovili závislosti najdôležitejších vlastností (hustota, viskozita, teplotná rozťažnosť, index lomu, povrchové napätie, impedančné spektrá) vybraných skiel od zloženia a teploty.

- 1/ CHROMČÍKOVÁ M., LISSOVÁ M., MOŠNER P., RÖSSLEROVÁ I., LIŠKA M., KOUDELKA L., Viscosity and activation energy for viscous flow of PbO-WO₃-P₂O₅ glasses. In Physics and Chemistry of Glasses: European Journal of Glass Science and Technology Part B, 2013, vol. 54, no. 3, p. 129-132.
- 2/ CHROMČÍKOVÁ M., LIŠKA M., MACHÁČEK J., ŠULCOVÁ J., Thermodynamic model and structure of CaO-P₂O₅ glasses, Journal of Thermal Analysis and Calorimetry, 144, 757-789 (2013)
- 3/ CHOVANEC J., CHROMČÍKOVÁ M., LIŠKA M., SHÁNĚLOVÁ J., MÁLEK J., Thermodynamic model and viscosity of Ge-S glasses. In Journal of Thermal Analysis and Calorimetry, 2013, p. 1-8, DOI 10.1007/s10973-013-3318-6
- 4/ CHOVANEC J., CHROMČÍKOVÁ M., PILNÝ P., SHÁNĚLOVÁ J., MÁLEK J., LIŠKA M., As₂Se₃ melt crystallization studied by quadratic approximation of nucleation and growth rate temperature dependence. In Journal of Thermal Analysis and Calorimetry, 2013, p. 1-7, DOI 10.1007/s10973-013-3085-4
- 5/ CHROMČÍKOVÁ M., LIŠKA M., GAŠPÁREKOVÁ E., TEPLANOVÁ M., KARELL R., Thermodynamic model and viscosity of selected zirconia containing silicate glasses. In Ceramics-Silikáty, 2013, vol. 57, no. 1, p. 66-73.
- 6/ CHROMČÍKOVÁ M., LIŠKA M., LISSOVÁ M., MOŠNER P., KOUDELKA L., Structural relaxation of PbO-WO₃-P₂O₅ glasses. In Journal of Thermal Analysis and Calorimetry, 2013, p. 1-8, DOI 10.1007/s10973-013-3082-7.

5.) Luminiscenčné vlastnosti ternárnych nitridov a oxynitridov kremíka dopovaných lantanoidmi (*Luminescence of lanthanoid-doped silicon-based ternary nitrides and oxynitrides*)

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| Zodpovedný riešiteľ: | Zoltán Lenčేశ |
| Trvanie projektu: | 1.1.2010 / 31.12.2013 |
| Evidenčné číslo projektu: | 2/0178/10 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | SAV: 10031 € |

Dosiahnuté výsledky:

Nitridáciou zmesí Mg₂Si (alebo LaSi), Si a Si₃N₄ boli pripravené svetlo emitujúce luminofovy na báze MgSiN₂ a LaSi₃N₅ dopovaných oxidmi kovov vzácných zemín: Eu₂O₃, Sm₂O₃ a CeO₂. Riešiteľský kolektív úspešne zvládol optimalizáciu prípravy luminoforov na báze ternárnych nitridov. Boli pripravené aj luminofovy na báze SiAlONu z polymérneho prekursoru. Optimalizáciou teplotného a plynového režimu syntézy luminoforov ako aj reguláciou obsahu dopantov (Eu, Sm, Ce) sa podarilo pripraviť keramické luminiscenčné materiály emitujúce modré, zelené, oranžové a červené svetlo – v závislosti od typu nitridu/oxynitridu a dopantu. Kombináciou monochromatických luminoforom možno pripraviť biele svetlo emitujúce diódy (LED).

Teoretickými výpočtami (metódou HSE06) boli stanovené šírky zakázaného pásu čistého ako aj dopovaného LaSi₃N₅, v dobrej zhode s experimentálnymi údajmi.

Publikácie:

- 1/ I.A.M. IBRAHIM, Z. LENČEŠ, L. BENCO, M. HRABALOVÁ, P. ŠAJGALÍK: Cerium-doped LaSi₃N₅: computed electronic structure and band gaps. J. Eur. Ceram. Soc., prijaté do tlače, Ref. No.: JECS-9492, DOI: 10.1016/j.jeurceramsoc.2013.12.054.
- 2/ I.A.M. IBRAHIM, Z. LENČEŠ, L. BENCO, M. HRABALOVÁ, P. ŠAJGALÍK: Samarium-doped LaSi₃N₅: synthesis, computed electronic structure and band gaps. J. Am. Ceram. Soc., odoslané do tlače, Ref. No. JACERS-34339.
- 3/ M. HRABALOVÁ, Z. LENČEŠ, A. CZÍMEROVÁ, P. ŠAJGALÍK: Luminofovy na bázi LaSi₃N₅ dopované prvky vzácných zemín. In Príprava a vlastnosti progresívnych keramických materiálov: odborný seminár, Ružín, 18.-19.november 2013, Ústav anorganickej chémie SAV, 2013, p. 29-31.
- 4/ I.A.M. IBRAHIM, Z. LENČEŠ, L. BENCO, P. ŠAJGALÍK: Samarium-doped LaSi₃N₅: computed electronic structure and band gaps. In Príprava a vlastnosti progresívnych keramických materiálov: odborný seminár, Ružín, 18.-19.november 2013, Ústav anorganickej chémie SAV, 2013, p. 35-37.
- 5/ Z. LENČEŠ, M. HRABALOVÁ, I. IBRAHIM, L. BENCO, P. ŠAJGALÍK, K. HIRAO, Influence of Eu, Ce and Sm dopants on the electronic structure and photoluminescence of MgSiN₂ and LaSi₃N₅-based phosphors. In ACTSEA 2013, 4th International symposium on advanced ceramics and technology, November 10-13, 2013, Taipei, Taiwan, p. 88-89.
- 6/ P. ŠAJGALÍK, Z. LENČEŠ, M. MICHÁLKOVÁ, Y. ZHOU, K. HIRAO, Ternary silicon nitrides - from engineering

to phosphors. In ACTSEA 2013, 4th International Symposium on Advanced Ceramics and Technology, November 10-13, 2013, Taipei, Taiwan, p. 84-85.

7/ M. HRABALOVÁ, Z. JONŠTA, Z. LENČEŠ: Rare earth-doped lanthanum silicon nitride-based phosphors. Den doktorandů 2013, VŠB TU Ostrava, 8.12. 2013, Vydal: VŠB TU Ostrava, Poruba, Czech Republic, p. 67-70.

8/ P. ŠAJGALÍK, Z. LENČEŠ: “ Svetlo a svietenie inak – výskum luminofórov na Ústave anorganickej chémie SAV“, Quark, 2013, p. 20-21.

6.) Príprava a vlastnosti nových typov organoíllov pre polymérne a environmentálne aplikácie (*Preparation and properties of novel organoclays for polymer and environmental applications*)

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| Zodpovedný riešiteľ: | Jana Madejová |
| Trvanie projektu: | 1.1.2013 / 31.12.2016 |
| Evidenčné číslo projektu: | 2/0132/13 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | SAV: 17213 € |

Dosiahnuté výsledky:

V prvom roku riešenia projektu sa vybrali ílové materiály obsahujúce rôzne smektity zo slovenských ílových ložísk (Jelšovský Potok), z Clay Mineral Society (Cheto a Wyoming) a Laponit, komerčne dostupný syntetický hectorit. Po separácii boli zo vzoriek pripravené rôzne typy alkyl-amónnych a alkyl-fosfóniových organo-derivátov. Z alkylamónnych kationov to boli predovšetkým kationy tzv. oktylového radu: monooktyl- (1C8), dioktyl- (2C8), trioktyl- (3C8) a tetraoktyl- (4C8) a séria n-trimetylalkylamónnych (Cn-TMA) a n-alkylamónnych (Cn-NH3) kationov (n=C6, C8, C10, C12, C14, C16 a C18). V prípade alkyl-fosfóniových kationov to boli tetramethyl až tetrabutyl formy. Na charakterizáciu vzoriek sa využili rôzne metódy, napr. rtg difrakcia, IČ spektroskopia v MIR a NIR oblasti, termická (TG/DTA) a chemická analýza a stanovenie kationovýmennej kapacity. Na alkyl-amónnych formách sa skúmal vplyv veľkosti a množstva kationu na expanziu medzivrstiev smektitu a na usporiadanie kationov. Sledovala sa aj adsorpcia vody pri rôznych relatívnych vlhkostiach na organicky modifikované ílové minerály. Množstvo H₂O sa stanovilo gravimetricky. Okrem toho sa na sledovanie množstva vody využila aj termická analýza. Vplyv prítomnosti vody na samotné organické kationy sa študoval použitím infračervenej spektroskopie v blízkej oblasti ako aj MAS NMR spektroskopiou na jadrách vodíka a uhlíka.

Ďalšia skupina výsledkov je publikovaná v práci: BRTÁŇOVÁ A., MADEJOVÁ J., BIZOVSKÁ V., KOMADEL P., Utilization of near infrared spectroscopy for studying solvation properties of Cu-montmorillonites. Spectrochimica Acta A. 123, 385-391, 2014

7.) ReSpect - praktický a účinný výpočtový nástroj pre štúdium zlúčenín ťažkých prvkov (*ReSpect - a practical and efficient computational tool to study heavy element compounds*)

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| Zodpovedný riešiteľ: | Oľga Malkin |
| Trvanie projektu: | 1.1.2013 / 31.12.2016 |
| Evidenčné číslo projektu: | 2/0148/13 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | SAV: 16802 € |

Dosiahnuté výsledky:

KŘÍSTKOVÁ A., ASHER J.R., MALKIN V., MALKINA O., Indirect nuclear (15)N-(15)N scalar coupling through a hydrogen bond: dependence on structural parameters studied by quantum chemistry tools. In Journal of Physical Chemistry A.Molecules, spectroscopy, kinetics, environment, and general theory, 2013, vol. 117, no. 38, p. 9235-9244.

8.) Štúdium vplyvu obsahu vody v slinkových mineráloch na ich štruktúrne, fyzikálno-chemické a mechanické vlastnosti - modelový a experimentálny prístup (*The influence of the water content in cementitious minerals on their structural, physical, chemical and mechanical properties – Model and experimental study*)

Zodpovedný riešiteľ: Eva Scholtzová
Trvanie projektu: 1.1.2012 / 31.12.2014
Evidenčné číslo projektu: 2/0083/12
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 3227 €

Dosiahnuté výsledky:

SCHOLTZOVÁ E., KUACKOVÁ L., KOŽÍŠEK J., TUNEGA D., PÁLKOVÁ H. (2013) Experimental and computational study of Thaumazite Structure. Cement and Concrete research. CEMCON-D-13-00475R1 (po recenzii)

Konferenčné príspevky:

DRÁBIK M., GÁLIKOVÁ Ľ., ŠPYRKOVÁ E., SCHOLTZOVÁ E., Hydrated cements and calcium-silicate-aluminate hydrates; from thermoanalytical events towards enthalpies. In IUPAC 2013 : 44th World Chemistry Congress : Istanbul, Turkey, 11 - 16 August 2013 : abstract book. - Istanbul, Turkey : Turkish Chemical Society, 2013, p. 1007.
DRÁBIK M., GÁLIKOVÁ Ľ., ŠPYRKOVÁ E., SCHOLTZOVÁ E., Hydratované cementy a Ca-Al-Si hydráty, od termoanalytických efektov k entalpií. 63. Zjazd chemikov Tatranské Matliare, Slovakia, ChemZi 9/1, 2013, 171
DRÁBIK, Milan - GÁLIKOVÁ, Ľubica - SCHOLTZOVÁ, Eva - ŠPYRKOVÁ, Eva. Thermoanalytical events and enthalpies of hydrated cements and calcium-silicate-aluminate hydrates. In Joint Czech-Hungarian-Polish-Slovak Thermoanalytical Conference : book of Contributions, University of Pardubice, Faculty of Chemical Technology 24-27 June 2013. 4th. - Pardubice, ČR Univerzita Pardubice, 2013, p. 35.

9.) Štúdium štruktúry a dynamiky vodíkových väzieb v tuhých látkach difrakčnými metódami kvantovej chémie a neelastickým rozptylom neutrónov (*Structure and dynamics of hydrogen bonds in solids by diffraction methods, quantum chemistry and inelastic neutron spectroscopy (INS)*)

Zodpovedný riešiteľ: Ľubomír Smrčok
Trvanie projektu: 1.1.2012 / 31.1.2015
Evidenčné číslo projektu: 2/0131/12
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 2029 €

Dosiahnuté výsledky:

Kryštalové štruktúry poly[bis(4-metylanilín) [tetra-₃-oxido-hexa-₂-oxido-hexaoxidopentamolybdén VI)], {(C₇H₁₀N)₂ [Mo₅O₁₆]}_n a poly[bis(4-iodoanilín) [tetra-₃-oxido-hexa-₂-oxido-hexaoxidopentamolybdén (VI)]], {(C₆H₇IN)₂ [Mo₅O₁₆]}_n boli vyriešené z laboratórnych práškových difrakčných dát a spresnené minimalizáciou celkovej energie v tuhej fáze. Štruktúry spomínaných zlúčenín sú okrem relatívne silných N-H...O stabilizované aj slabými vodíkovými väzbami typu C-H...O a C-H...?. Úloha divodikovej C-H...H-C väzby v jednej zo zlúčenín zatiaľ nebola teoreticky objasnená. Sila medzimolekulových interakcií v zlúčeninách bola odhadnutá prostredníctvom DSC experimentov.

M. OSZAJCA, Ľ. SMRČOK, W. LASOCHA, Bis(4-methylanilinium) and bis(4-iodoanilinium) pentamolybdates from laboratory X-ray powder data and total energy minimization, Acta Crystallographica Section C. Crystal Structure Communications, 2013, vol. 69, p. 1367-1372.

10.) Výskum keramických kompozitných materiálov pripravených z polymérnych prekursorov SiOC pre vysoko korozívne prostredie (*Research of ceramic composite materials prepared from polymer precursor SiOC for high corrosive environments*)

Zodpovedný riešiteľ: Pavol Šajgalík
Trvanie projektu: 1.1.2010 / 31.12.2013
Evidenčné číslo projektu: 2/0036/10
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 13111 €

Dosiahnuté výsledky:

Metódou horúceho lisovania boli pripravené hutné Si₃N₄/SiC mikro/nano-kompozity s rôznym zložením fázy na hraniciach zŕn, pričom bolo použitých šesť rôznych prídavkov spekania (Lu₂O₃, Yb₂O₃, Y₂O₃, Sm₂O₃, Nd₂O₃ a La₂O₃). Tvorba SiC nano inklúzií bola dosiahnutá karbotermickou redukciou SiO₂ in situ priamo v procese spekania. Lomová húževnatosť, tvrdosť a pevnosť materiálov, ktoré boli merané pri izbovej teplote, narastali so zmenšujúcim sa iónovým polomerom katiónu použitého oxidu zo skupiny vzácnych zemín (t.j. od La³⁺ to Lu³⁺). Kompozitný materiál s prídavkom Lu₂O₃ vykazoval najvyššiu tvrdosť pri zachovaní si dostatočnej lómovej húževnatosti a pevnosti. Ten istý mikro/nano kompozitný materiál sa vyznačoval najvyššou odolnosťou voči vysokoteplotnému tečeniu v teplotnom interval od 1250°C do 1400°C, pričom bolo použité zaťaženie v rozsahu od 50-150MPa. Okrem Si₃N₄-SiC kompozitu spekaného s prídavkom Lu₂O₃, bol rýchlosť limitujúcim faktorom mechanizmu tečenia pre všetky ostatné materiály, difúzia pridaných katiónov po hraniciach zŕn smerom k povrchu vzoriek. Táto difúzia katiónov bola silno potlačená v kompozite s prídavkom Lu₂O₃ vďaka pozitívnemu vplyvu teplotne stabilnej fázy na hraniciach zŕn a prítomnosti SiC častíc lokalizovaných predovšetkým na hraniciach Si₃N₄ zŕn. Nanočastice na hraniciach zŕn pôsobia ako prekážky pre migráciu katiónov z prídavkov spekania, výsledkom čoho je zvýšená odolnosť voči oxidácii Si₃N₄-SiC-Lu₂O₃ kompozitu, kde rýchlosť limitujúcim krokom je vnútorná difúzia kyslíka cez oxidovú vrstvu smerom do objemu keramického material.

Publikácie:

TATARKO P., KAŠIAROVÁ M., DUSZA J., ŠAJGALÍK P., Influence of rare-earth oxide additives on the oxidation resistance of Si₃N₄-SiC nanocomposites. In Journal of the European Ceramic Society, 2013, vol. 33, p. 2259-2268.
TATARKO P., KAŠIAROVÁ M., CHLUP Z., DUSZA J., ŠAJGALÍK P., VÁVRA I., Influence of rare-earth oxide additives and SiC nanoparticles on the wear behaviour of Si₃N₄-based composites at temperatures up to 900 C. In Wear: an international journal on the science and technology of friction, lubrication and wear, 2013, vol. 300, p. 155-162.

11.) Fluoridové elektrolyty s nízkou teplotou topenia s potenciálom pre elektrolytickú výrobu hliníka (*Low temperature melting fluoride systems with potential for electrolytic aluminium production*)

Zodpovedný riešiteľ: František Šimko
Trvanie projektu: 1.1.2010 / 31.12.2013
Evidenčné číslo projektu: 2/0179/10
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 10451 €

Dosiahnuté výsledky:

1/ KORENKO M., STRAKA M., SZATMÁRY L., AMBROVÁ M., UHLÍŘ, J. Electrochemical separation of uranium in the molten system LiF-NaF-KF-UF₄. In Journal of Nuclear Materials, 2013, vol. 440, p. 332-337
2/ KORENKO M., PRIŠČÁK J., ŠIMKO F., Electrical conductivity of the systems based on Na₃AlF₆-SiO₂ melt. In Chemical Papers, 2013, vol. 67, no. 10, p. 1350-1354.
3/ KONTRÍK M., PAVLÍK V., ŠIMKO F. Korózia superzliatiny Incoloy 800H/HT v eutektickej zmesi LiF-NaF-KF s

rôznym prídavkom fluoridu chromitého. In Študentská vedecká konferencia PriF UK 2013 zborník recenzovaných príspevkov, Ed. M. Galamboš, V. Džugasová, A. Ševčovičová, Univerzita Komenského v Bratislave vo Vydavateľstve UK, 2013, s. 1038-1043

4/ KONTRÍK M., ŠIMKO F. Korózia TiB₂ v tavenine KF-AlF₃ s prídavkom Al₂O₃. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013, zborník príspevkov. Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 87-94

5/ PAVLÍK V., KONTRÍK M., BOČA M., Vplyv prídavkov vybraných fluoridov na koróziu zliatiny Incoloy 800H/HT v tavenine (LiF-NaF-KF)eut. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013, zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 103-111

6/ ŠIMURDA M., KORENKO M., Príprava hlboko podchladených fluoridových tavenín pomocou techník RSP. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013 : zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 79-86

7/ KORENKO M., VASKOVÁ Z., ŠIMKO F., ŠIMURDA M. AMBROVÁ M., SHI Z. Electrical conductivity and viscosity of cryolite electrolytes for solar grade silicon (Si-SoG) electrowinning. In CNS 2013. The Fifth Chinese-Norwegian symposium on light metals and new energy materials, october 14-17, 2013, Hangzhou, China, 2013, p. 148

8/ KORENKO M., VASKOVÁ Z., ŠIMKO F., WANG Z., SHI Z., Density and electrical conductivity of Na₃AlF₆-SiO₂ melts for the electrowinning of solar-grade silicon (SoG-Si). In CNS 2013, The Fifth Chinese-Norwegian symposium on light metals and new energy materials, October 14-17, 2013, Hangzhou, China, Shanghai Jiao Tong University, 2013, p. 149

9/ ŠIMKO F. MAS NMR study of the solidified cryolite systems with FeO addition. In 17th ESFC - Paris 2013, 17th european symposium on fluorine chemistry, July 21-25, 2013, book of abstracts, 2013, p. 78

12.) Štúdium mechanizmu korózie materiálov používaných pri tavení priemyselne vyrábaných skiel (*Study of the mechanism of corrosion of materials used in a melting of industrially produced glasses*)

| | |
|---|-------------------------------|
| Zodpovedný riešiteľ: | Peter Šimurka |
| Trvanie projektu: | 1.1.2012 / 31.12.2015 |
| Evidenčné číslo projektu: | 2/0165/12 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | SAV: 4227 € |

Dosiahnuté výsledky:

Na vzorkách žiaromateriálov odobratých po skončení kampane z taviacej a pracovnej časti boli SEM a EDX analýzou stanovené ich koncentračné profily. Boli porovnané výsledky získané analýzou z rôznych častí taviaceho agregátu - tak z oblasti kontaktu materiálu so sklovinou ako aj z oblasti stien nad hladinou skloviny. S cieľom identifikovať potenciálny zdroj nehomogenít boli získané výsledky porovnané so zložením nehomogenít vyskytujúcich sa vo výrobkoch počas štandardnej výroby počas obdobia 24 mesiacov. Výsledky boli prezentované na konferenciách formou posterov.

1/ ŠIMURKA P., KRAXNER J., VRABEL P., PAUČO T.: Cords at the tableware glass melting – composition and potential sources, The 23rd International Congress on Glass, Praha, Česká republika, 1.-5. júl 2013

2/ ŠIMURKA P., SEDLÁČEK J., KRAXNER J.: Study of Al₂O₃-ZrO₂-SiO₂ (AZS) refractory material corrosion in industrially tableware glas melt, The 10th Pacific Rim Conference on Ceramic and Glass Technology, San Diego, USA June 2-7, 2013

Programy: APVV

13.) Anorganické fluoridové taveniny - komplexné štúdium spektrálnych, difrakčných, fyzikálochemických, termodynamických a štruktúrnych charakteristík (*Inorganic fluoride melts - the complex study of spectral, diffraction, physicochemical, thermodynamical and structural characteristics*)

| | |
|---|-------------------------------|
| Zodpovedný riešiteľ: | Miroslav Boča |
| Trvanie projektu: | 1.5.2011 / 31.10.2014 |
| Evidenčné číslo projektu: | APVV-0460-10 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | APVV: 83333 € |

Dosiahnuté výsledky:

- 1/ KORENKO M., STRAKA M., SZATMÁRY L., AMBROVÁ M., UHLÍŘ, J. Electrochemical separation of uranium in the molten system LiF-NaF-KF-UF₄. In Journal of Nuclear Materials, 2013, vol. 440, p. 332-337
- 2/ KUBÍKOVÁ B. MACKOVÁ I., BOČA M., Phase analysis and volume properties of the (LiF-NaF-KF)_{eut}-K₂ZrF₆ system. In Monatshefte für Chemie, 2013, vol. 144, p. 295-300.
- 3/ NERÁD I., MIKŠÍKOVÁ E., KOSA L., ADAMKOVIČOVÁ K., Premelting at fusion of titanite CaTiSiO₅: a calorimetric study. In Physics and Chemistry of Minerals, 2013, vol. 40, no. 7, p. 597-602
- 4/ KORENKO M., PRIŠČÁK J., ŠIMKO F., Electrical conductivity of the systems based on Na₃AlF₆-SiO₂ melt. In Chemical Papers, 2013, vol. 67, no. 10, p. 1350-1354.
- 5/ KONTRÍK M., ŠIMKO F., Korózia TiB₂ v tavenine KF-AlF₃ s prídavkom Al₂O₃. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013 : zborník príspevkov. Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 87-94
- 6/ PAVLÍK V., KONTRÍK M., BOČA M., Vplyv prídavkov vybraných fluoridov na koróziu zliatiny Incoloy 800H/HT v tavenine (LiF-NaF-KF)_{eut}. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013, zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 103-111
- 7/ ŠIMURDA M., KORENKO M., Príprava hlboko podchladených fluoridových tavenín pomocou techník RSP. In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013 : zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 79-86
- 8/ BOČA M. X-ray photoelectron spectroscopy of inorganic fluorides. In 17th ESFC - Paris 2013. 17th european symposium on fluorine chemistry, july 21-25, 2013, book of abstracts, 2013, p. 272
- 9/ VASKOVÁ Z., ŠPYRKOVÁ E., KUBÍKOVÁ B., GURIŠOVÁ V., BOČA M., DTA-TG investigation of K₂ZrF₆. In Joint Czech-Hungarian-Polish-Slovak Thermoanalytical Conference: book of Contributions, University of Pardubice, 24-27 June 2013, Pardubice, ČR Univerzita Pardubice, 2013, p. 131.
- 10/ VASKOVÁ Z., HADZIMOVÁ E., KUBÍKOVÁ B., GURIŠOVÁ V., BOČA M., DTA-TG investigation of K₂ZrF₆. In ChemZi: slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel: 65. Zjazd chemikov, Tatranské Matliare 9. - 13. 9. 2013, roč. 9, č. 1, s. 173

14.) Štúdium potenciálu fluoridových tavenín pre vysokoteplotné aplikácie (*A study of the potential of fluoride molten salts for high temperature applications*)

| | |
|---|-------------------------------|
| Zodpovedný riešiteľ: | Miroslav Boča |
| Trvanie projektu: | 1.9.2009 / 31.8.2013 |
| Evidenčné číslo projektu: | LPP-0344-09 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | APVV: 12952 € |

Dosiahnuté výsledky:

KUBÍKOVÁ B. MACKOVÁ I., BOČA M., Phase analysis and volume properties of the (LiF-NaF-KF)_{eut}-K₂ZrF₆ system. In Monatshefte für Chemie, 2013, vol. 144, p. 295-300.

15.) Fotoaktívne hybridné nanomateriály s luminiscenčnými a antimikrobiálnymi vlastnosťami. (*Photoactive hybrid nanomaterials with luminescent and antimicrobial properties.*)

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|---|-------------------------------|
| Zodpovedný riešiteľ: | Juraj Bujdák |
| Trvanie projektu: | 1.7.2012 / 31.12.2015 |
| Evidenčné číslo projektu: | APVV-0291-11 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 2 - Slovensko: 2 |
| Čerpané financie: | APVV: 19524 € |

Dosiahnuté výsledky:

Získali sme niekoľko cenných informácií o vzájomnom vzťahu medzi fotoaktivitou a molekulovou agregáciou a identifikovali parametre, ktoré sa podieľajú na znižovaní fotoaktivity farbív. Ďalej sme získali cenné výsledky o mechanizme vzniku molekulových agregátov a identifikovali spôsoby, ako sa vyhnúť znižovaniu fotoaktivity v hybridných materiáloch. Po roku a pol projektu sme dokázali pripraviť nové hybridné materiály vrstevnatých kremičitanoch s fotoaktívnymi organickými farbivami. V niektorých prípadoch bola potrebná modifikácia vrstevnatých kremičitanov napr. adsorpciou alkylamónnymi kationmi, polyelektrolými, alebo modifikácia farbiva, napr. použitím reaktívnych fluorofórov, alebo fluorofórov viazaných v dutinách cyktodextrínov.

16.) Mechanizmy korózie a mikromechanické vlastnosti dentálnych materiálov (*Mechanisms of corrosion and micromechanical properties of dental materials*)

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|---|-------------------------------|
| Zodpovedný riešiteľ: | Dušan Galusek |
| Trvanie projektu: | 1.7.2012 / 31.12.2015 |
| Evidenčné číslo projektu: | APVV-0218-11 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 3 - Slovensko: 3 |
| Čerpané financie: | APVV: 19496 € |

Dosiahnuté výsledky:

Vyvinuli sa metodiky hodnotenia korózie ľudských zubov in vitro vo vybraných kyslých nápojoch, ako aj na vývoj metodík analýzy používaných korózných médií pred a po korózii. Obsah fosforu v koróznom médiu stúpa s teplotou a s dĺžkou expozície vzorky. V kvázi - dynamických podmienkach boli zaznamenané vyššie kumulatívne obsahy Ca a P. Ku korózií ľudských zubov v kyslom prostredí bieleho vína dochádza v dôsledku kongruentného rozpúšťania minerálneho hydroxyapatitu. U korodovaných vzoriek sa pozorovalo viditeľné porušenie zubnej skloviny, demonštrované zvýraznením hraníc medzi jednotlivými zrnami hydroxyapatitu a zdrsnení vlastného povrchu zrn hydroxyapatitu. Priemerné hodnoty tvrdosti aj elastickeho modulu sa po korózii vo víne významne znížili. Korózia v testovanom druhu bieleho vína má výrazne negatívny vplyv na nano a mikrotvrdosť a elastickeý modul zubnej skloviny, ako aj jej odolnosť voči oteru.

1/ GAALOVÁ P., GALUSKOVÁ D., GALUSEK D., Acid drinks corrosion and micromechanical properties of human teeth enamel. In Preparation of ceramic materials, Xth international conference, 18-20th june, 2013, proceedings Technical University of Košice, 2013, p. 62-63.

2/ GALUSKOVÁ D., GAALOVÁ P., KOVÁČ J., KOVÁČ D., GALUSEK D., Corrosion of human teeth enamel in acid drinks. In Preparation of ceramic materials. Xth international conference, 18-20th june, 2013, proceedings Technical University of Košice, 2013, p. 66-67.

3/ GALUSKOVÁ D., GAALOVÁ P., GALUSEK D., KOVÁČ J., KOVÁČ D., Kinetics of early stages dissolution of human enamel in white wine. In ECERS XIII. 13th conference of the European ceramic society, june 23-27, 2013, book of abstracts, Limoges, France, 2013, p. 302.

4/ GALUSEK D., Kinetics of early stages dissolution of human enamel in acid drinks, p. 137 In: SAS-IVF-JST Workshop, SAS Congress Centre, Smolenice, Slovakia, July 9-11 2013

17.) Vývoj vodivej keramiky na báze SiC (*Development SiC based conductive ceramics*)

Zodpovedný riešiteľ: Pavol Hvizdoš
Zodpovedný riešiteľ v organizácii SAV: Pavol Šajgalík
Trvanie projektu: 1.10.2013 / 30.9.2017
Evidenčné číslo projektu: APVV-0108-12
Organizácia je koordinátorom projektu: nie
Koordinátor:
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: APVV: 2525 €

Dosiahnuté výsledky:

Na ÚACH SAV sa v počiatočnej fáze projektu začalo intenzívne pracovať na prvých modelových experimentoch v systéme Y2O3 – SiO2 – Ti – NbC (systém na hraniciach SiC zŕn). V tomto systéme sa stanovil vplyv zmeny chemického zloženia spekacích prísad (Y2O3 a SiO2) a prísad zvyšujúcich elektrickú vodivosť (Ti a NbC) na zmenu ich fázového zloženia a zmenu elektrickej vodivosti po tepelnom spracovaní. Doterajšie výsledky ukazujú, že vzorky s obsahom 50% Ti-NbC spekané pri teplote 1500°C majú hodnotu elektrickej vodivosti na úrovni 238,1 Smm-1 a tvrdosť podľa Vickersa 10,5 GPa. Z hľadiska využiteľnosti študovaného systému pri príprave elektricky vodivej keramiky na báze SiC je zloženie označené ako N50 zatiaľ najlepším riešením a bude použité pri príprave kompozitného materiálu. Experimentálne práce boli zahájené a dosiahnuté výsledky sú v súlade s harmonogramom a stanovenými cieľmi.

18.) Štruktúra a vlastnosti oxidových skiel určených na aplikácie v jadrovej energetike (*Structure and properties of oxide glasses for application in nuclear power technology*)

Zodpovedný riešiteľ: Mária Chromčíková
Trvanie projektu: 1.7.2012 / 31.12.2015
Evidenčné číslo projektu: APVV-0487-11
Organizácia je koordinátorom projektu: nie
Koordinátor: Trenčianska univerzita Alexandra Dubčeka v Trenčíne
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: APVV: 21216 €

Dosiahnuté výsledky:

Od začiatku projektu (1.7.2012) bola hlavná pozornosť riešiteľov projektu zameraná na experimentálnu časť a to na prípravu skiel na meranie ich fyzikálnych vlastností a na skúmanie kinetiky a mechanizmov ich korózie vo vodných roztokoch.

1/ CHROMČÍKOVÁ M., LIŠKA M., MACHÁČEK J., ŠULCOVÁ J., Thermodynamic model and structure of CaO-P2O5 glasses, Journal of Thermal Analysis and Calorimetry, 144, 757-789 (2013)

2/ CHROMČÍKOVÁ M., LIŠKA M., GAŠPÁREKOVÁ E., TEPLANOVÁ M., KARELL R., Thermodynamic model and viscosity of selected zirconia containing silicate glasses. In Ceramics-Silikáty, 2013, vol. 57, no. 1, p. 66-73.

3/ CHROMČÍKOVÁ M., LIŠKA M., LIŠOVÁ M., MOŠNER P., KOUDELKA L., Structural relaxation of PbO-WO3-P2O5 glasses. In Journal of Thermal Analysis and Calorimetry, 2013, p. 1-8, DOI 10.1007/s10973-013-3082-7.

19.) Vývoj nitridu kremičitého s prídavkom multivrstiev grafénu. (*Development of Si3N4 with addition of graphene platelets*)

Zodpovedný riešiteľ: Monika Kašiarová
Zodpovedný riešiteľ v organizácii SAV: Pavol Šajgalík
Trvanie projektu: 1.7.2012 / 31.12.2015
Evidenčné číslo projektu: APVV-0161-11
Organizácia je koordinátorom projektu: nie
Koordinátor:

Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: APVV: 10000 €

Dosiahnuté výsledky:

Predmetom doterajšieho výskumu bolo sledovať vplyv metódy homogenizácie na výsledné vlastnosti kompozitného materiálu na báze nitridu kremičitého s prídavkom 7 hm. % multivrstiev grafénu. Zmesi keramických práškov boli homogenizované nasledovnými metódami:

1. Homogenizácia v planetárnom mlyne s alebo bez použitia ultrazvukovej sondy na rozdispergovanie/oddelenie grafénových multivrstiev, izopropanol slúžil ako disperzné médium
2. Attritorové mletie
3. Homogenizácia zmesi na valcoch za sucha alebo za mokra, kde sa opäť použil izopropanol ako disperzné médium.

Prídavok multivrstiev grafénu do keramickej matrice spôsobil zníženie hutnosti všetkých pripravených kompozitov po spekaní (žiarové lisovanie pri 1600°C/60 min, zaťaženie 30 MPa, pretlak dusíku 40 mbar). Toto zníženie bolo po analýze údajov z riadkovacieho elektrónového mikroskopu prisúdené delaminácii multivrstiev grafénu.

Zistilo sa, že rozdispergovanie multivrstiev grafénu v izopropanole pomocou ultrazvuku má priaznivý účinok na mechanické vlastnosti. Najlepšia spomedzi testovaných metód bola homogenizácia v planetárnom mlyne s použitím ultrazvuku kde bola ohybová pevnosť 740±95 MPa. Naopak, štúdium mikroštruktúr lomových plôch preukázalo nedostatočné rozdispergovanie grafénu vo vzorke, ktorá bola pripravovaná za sucha na valcoch. Táto vzorka mala aj najnižšiu ohybovú pevnosť, a to: 426±126 MPa. V závislosti od homogenizačnej metódy sa veľkosť trhlín pohybovala v rozmedzí od 20 µm do 250 µm, pričom najmenšie trhliny mala opäť vzorka pripravovaná homogenizáciou v planetárnom mlyne s použitím ultrazvuku.

Publikácie:

- 1/ TATARKO P., KAŠIAROVÁ M., DUSZA J., ŠAJGALÍK P. Influence of rare-earth oxide additives on the oxidation resistance of Si₃N₄-SiC nanocomposites. In Journal of the European Ceramic Society, 2013, vol. 33, p. 2259-2268.
- 2/ KVETKOVÁ L., DUSZOVÁ A., KAŠIAROVÁ M., DORČÁKOVÁ F., DUSZA J., BALÁZSI C., Influence of processing on fracture toughness of Si₃N₄ + graphene platelet composites Journal of the European Ceramic Society 33 (2013) 2299–2304

Prednášky:

- 1/ MICHÁLKOVÁ M., KAŠIAROVÁ M., ŠAJGALÍK P., Si₃N₄/graphene composites I: different methods of preparation. In Preparation of ceramic materials: 10th international conference. Herľany, 18.-20.6.2013. Eds. Beatrice Plešingerová et al. Technical University of Košice, p. 32.
- 2/ KAŠIAROVÁ M., MICHÁLKOVÁ M., KOVALČÍKOVÁ A., KVETKOVÁ L., ŠAJGALÍK P., DUSZA J., Si₃N₄/graphene composites II: mechanical properties. In Preparation of ceramic materials: 10th international conference. Herľany, 18.-20.6.2013, Eds. Beatrice Plešingerová et al. Technical University of Košice, 2013, p. 33.

Postre:

- 1/ MICHÁLKOVÁ M., KAŠIAROVÁ M., DUSZA J., ŠAJGALÍK P., Si₃N₄/GNPs prepared by different homogenization techniques: impact on mechanical properties, FRACTOGRAPHY OF ADVANCED CERAMICS 2013 Sept.29 - Oct.2, 2013, The Smolenice Castle, Slovak Republic
- 2/ KAŠIAROVÁ M., MICHÁLKOVÁ M., TATARKO P., KOVALČÍKOVÁ A., KVETKOVÁ L., DUSZA J., ŠAJGALÍK P., Influence of graphene multi-nanoplatelets on the fracture behaviour of Si₃N₄ ceramics FRACTOGRAPHY OF ADVANCED CERAMICS, Sept 29 – Oct 2, 2013, The Smolenice Castle, Slovak Republic

20.) Korešpondenčné semináre z chémie a biológie pre stredné školy a seminár z prírodných vied pre základné školy (*Correspondence seminars from chemistry and biology for secondary schools and seminar of natural sciences for elementary schools*)

Zodpovedný riešiteľ: Stanislav Kedžuch
Trvanie projektu: 1.9.2009 / 31.8.2013
Evidenčné číslo projektu: LPP-0277-09
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: APVV: 22868 €

Dosiahnuté výsledky:

V školskom roku 2012/2013 bolo zapojených 5460 študentov základných a stredných škôl. V júni boli zorganizované 3

odborné sústreďenia pre najlepších riešiteľov, ktorých sa zúčastnilo 77 študentov. Bolo vydaných 9 zborníkov súťažných úloh a učebný text pre odborné sústreďenie.

21.) Organaily a ich kompozity s polymérmi (*Organoclays and their composites with polymers*)

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| Zodpovedný riešiteľ: | Peter Komadel |
| Trvanie projektu: | 1.5.2011 / 31.10.2014 |
| Evidenčné číslo projektu: | APVV-0362-10 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 1 - Slovensko: 1 |
| Čerpané financie: | APVV: 42900 € |

Dosiahnuté výsledky:

- 1/ CZÍMEROVÁ A., JANKOVIČ Ľ., MADEJOVÁ J., ČEKLOVSKÝ A., Unique photoactive nanocomposites based on rhodamine 6G/polymer/montmorillonite hybrid systems. In Journal of Polymer Science. Part B.Polymer Physics, 2013, vol. 51, p. 1672-1679.
- 2/ HRACHOVÁ J., KOMADEL P., JOCHEC MOŠKOVÁ D., KRAJČI J., JANIGOVÁ I., ŠLOUF M., CHODÁK I., Properties of organo-clay/natural rubber nanocomposites: Effects of organophilic modifiers. In Journal of Applied Polymer Science, 2013, vol. 127, p. 3447 - 3455.
- 3/ PÁLKOVÁ H., HRONSKÝ V., JANKOVIČ Ľ., MADEJOVÁ J., The effect of acid treatment on the structure and surface acidity of tetraalkylammonium-montmorillonites. In Journal of Colloid and Interface Science, 2013, vol. 395, p. 166-175.
- 4/ SCHOLTZOVÁ E., TUNEGA D., MADEJOVÁ J., PÁLKOVÁ H., KOMADEL P., Theoretical and experimental study of montmorillonite intercalated with tetramethylammonium cation. In Vibrational Spectroscopy, 2013, vol. 66, p. 123-131.

22.) Genéza perlitu a inovatívne prístupy pri jeho ťažbe a spracovaní (*Perlite genesis and innovative approaches to its exploitation and processing*)

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|---|---------------------------|
| Zodpovedný riešiteľ: | Jana Madejová |
| Trvanie projektu: | 1.10.2013 / 30.9.2017 |
| Evidenčné číslo projektu: | APVV-0339-12 |
| Organizácia je koordinátorom projektu: | nie |
| Koordinátor: | Prírodovedecká fakulta UK |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | APVV: 2000 € |

Dosiahnuté výsledky:

Vzhľadom na dobu riešenia - tri mesiace - sa nezískali ešte žiadne výsledky.

23.) Relativistické výpočty NMR a EPR parametrov: od čísel k pochopeniu podstaty (*Relativistic calculations of NMR and EPR parameters: from numbers to insight*)

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| Zodpovedný riešiteľ: | Oľga Malkin |
| Trvanie projektu: | 1.9.2009 / 31.8.2013 |
| Evidenčné číslo projektu: | LPP-0326-09 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | APVV: 13833 € |

Dosiahnuté výsledky:

BÜHL M., KNIGHT F.R., KŘÍSTKOVÁ A., MALKIN-ONDÍK I., MALKINA O., RANDALL R.A.M., SLAWIN A.M.Z., WOOLINS J.D., Weak Te, Te interactions through the looking glass of NMR spin-spin coupling. In *Angewandte Chemie*, 2013, vol. 52, no. 9, p. 2495-2498.

24.) Relativistické výpočty parametrov NMR a EPR spektroskopie pre zlúčeniny obsahujúce ťažké prvky: pokračovanie metodologického vývoja a aplikácie (*Relativistic calculations of parameters of NMR and EPR spectroscopy for compounds containing heavy elements: further methodological development and applications*)

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| Zodpovedný riešiteľ: | Vladimír Malkin |
| Trvanie projektu: | 1.5.2011 / 30.4.2014 |
| Evidenčné číslo projektu: | APVV-0483-10 |
| Organizácia je koordinátorom projektu: | áno |
| Koordinátor: | Ústav anorganickej chémie SAV |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | APVV: 36737 € |

Dosiahnuté výsledky:

1/ KOMOROVSKÝ S., REPISKÝ M., RUUD K., MALKINA O., MALKIN V., Four-component relativistic density functional theory calculations of NMR shielding tensors for paramagnetic systems. In *Journal of Physical Chemistry A: Molecules, spectroscopy, kinetics, environment, and general theory*, 2013, vol. 117, no. 51, p. 14209-14219.

2/ BÜHL M., KNIGHT F.R., KŘÍSTKOVÁ A., MALKIN-ONDÍK I., MALKINA O., RANDALL R.A.M., SLAWIN A.M.Z., WOOLINS J.D., Weak Te, Te interactions through the looking glass of NMR spin-spin coupling. In *Angewandte Chemie*, 2013, vol. 52, no. 9, p. 2495-2498.

25.) Polyaplikovateľné heterocykly - návrh štruktúry, syntéza a vlastnosti (*Polyaplicable heterocycles - design, synthesis and properties*)

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| Zodpovedný riešiteľ: | Ľubomír Smrčok |
| Trvanie projektu: | 1.7.2012 / 31.12.2015 |
| Evidenčné číslo projektu: | |
| Organizácia je koordinátorom projektu: | nie |
| Koordinátor: | Fakulta chemickej a potravinárskej technológie STU |
| Počet spoluriešiteľských inštitúcií: | 0 |
| Čerpané financie: | APVV: 3762 € |

Dosiahnuté výsledky:

Vyriešili a spresnili sme kryštálovú štruktúru 1,2,3,3,4,4,5,5,6,6-dekafluorocyclohex-1-énu (C₆F₁₀, pri izbovej teplote kvapalná) z práškových neutrónových difrakčných dáta získaných pri 4.2K kombináciou hľadania v priamom priestore a optimalizácie štruktúry minimalizáciou celkovej energie. Medzimolekulové interakcie v štruktúre boli analyzované pomocou presných molekulových výpočtov (DFT, MP2) pričom bolo zistené, že najsilnejšia interakcia je poriadku asi 4 kcal/mol. Táto hodnota zodpovedá interakčnej energii diméru benzene alebo diméru vody, zatiaľ čo najslabšie interakcie sú len v rozsahu iba 1-2 kcal/mol.

SMRČOK Ľ., MACH P., LE BAIL A., Decafluorocyclohex-1-ene at 4.2 K - crystal structure and theoretical analysis of weak interactions, *Acta Crystallographica Section B*, 2013, vol. 69, p. 395-404.

26.) Vývoj kompozitných biomateriálov na báze nitridu kremičitého (*Development of composite biomaterials based on silicon nitride*)

| | |
|-----------------------------|-----------------------|
| Zodpovedný riešiteľ: | Pavol Šajgalík |
| Trvanie projektu: | 1.5.2011 / 31.10.2014 |

Evidenčné číslo projektu: APVV-0500-10
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: APVV: 54000 €

Dosiahnuté výsledky:

Riešenie projektu prebieha v súlade so stanoveným harmonogramom. V predchádzajúcom roku bola pórovitá keramická matrica na báze nitridu kremičitého pripravená replikačnou metódou s použitím polyuretánovej peny, čím sme získali štruktúru podobnú štruktúre ľudskej trabekulárnej kosti. V práci boli použité dve metódy spekania a to voľné spekanie kompakto nitridu kremičitého na vzduchu (ASSN) a nitridácia kompakto kremíka za vzniku dodatočne spekaného reakčne viazaného nitridu kremičitého (SRBSN). Pripravená keramika bola ocharakterizovaná z hľadiska fázového zloženia, mikroštruktúry a mechanických vlastností.

V ďalšom kroku sme sa venovali príprave hydroxyapatitu (HA) metódou sól-gél, ktorý uľahčuje proces prijatia implantátu. Po optimalizácii samotného procesu prípravy sa sól prekursora naniesol na maticu porézneho nitridu kremičitého a po výpale vznikol kompozit Si₃N₄-HA.

Publikácie:

- 1/ BODIŠOVÁ K., KAŠIAROVÁ M., DOMANICKÁ M., HNATKO M., LENČEŠ Z., VARCHULOVÁ NOVÁKOVÁ Z., VOJTAŠŠÁK J., GROMOŠOVÁ S., ŠAJGALÍK P., Porous silicon nitride ceramics designed for bone substitute applications. In *Ceramics International*, 2013, vol. 39, p. 8355-8362.
- 2/ KOVALČIKOVÁ A., DUSZA J., ŠAJGALÍK P., Influence of the heat treatment on mechanical properties and oxidation resistance of SiC-Si₃N₄ composites. In *Ceramics International*, 2013, vol. 39, p. 7951-7957.
- 3/ TATARKO P., KAŠIAROVÁ M., DUSZA J., ŠAJGALÍK P., Influence of rare-earth oxide additives on the oxidation resistance of Si₃N₄-SiC nanocomposites. In *Journal of the European Ceramic Society*, 2013, vol. 33, p. 2259-2268.
- 4/ TATARKO P., KAŠIAROVÁ M., CHLUP Z., DUSZA J., ŠAJGALÍK P., VÁVRA I., Influence of rare-earth oxide additives and SiC nanoparticles on the wear behaviour of Si₃N₄-based composites at temperatures up to 900 C. In *Wear: an international journal on the science and technology of friction, lubrication and wear*, 2013, vol. 300, p. 155-162.
- 5/ HNATKO M., LENČEŠ Z., ČOPAN P., BIROŠOVÁ L., MATEJOV P., JANTOVÁ S., Synthesis, characterizations and in vitro assessment of the cytotoxicity and genotoxicity of novel silicon nitride-based porous ceramics. In *Materials Sciences and Applications*, 2013, vol. 4, p. 407-418.

Konferencie:

- 1/ DOMANICKÁ M., BODIŠOVÁ K., LENČEŠ Z., VILČEKOVÁ Z., KAŠIAROVÁ M., HNATKO M., ŠAJGALÍK P., Preparation and characterization of porous silicon nitride for bioapplication. In *Preparation of ceramic materials: 10th international conference*. Herľany, 18.-20.6.2013. Eds. Beatrice Plešingerová et al. Technical University of Košice, 2013, p. 60-61.
- 2/ KOVALČIKOVÁ A., KUREK P., DUSZA J., ŠAJGALÍK P., MIHALIKOVÁ M., Effect of the counterpart material on wear characteristics of silicon carbide ceramics. In *Preparation of ceramic materials : 10th international conference*. Herľany, 18.-20.6.2013. Eds. Beatrice Plešingerová et al., Technical University of Košice, 2013, p. 36-37.
- 3/ VILČEKOVÁ Z., KAŠIAROVÁ M., BODIŠOVÁ K., DOMANICKÁ M., ŠAJGALÍK P., Study of the preparation methods and their influence on the mechanical properties of porous Si₃N₄ biomaterials. In *Preparation of ceramic materials : 10th international conference*. Herľany, 18.-20.6.2013. Eds. Beatrice Plešingerová et al. Technical University of Košice, 2013, p. 114-115.

Programy: Štrukturálne fondy EÚ Výskum a vývoj

27.) Aplikovaný výskum technológie plazmotermických procesov (*Applied Research of Technology of Plasma-thermal processes*)

Zodpovedný riešiteľ: Miroslav Boča
Trvanie projektu: 1.1.2011 / 31.12.2013
Evidenčné číslo projektu:
Organizácia je koordinátorom projektu: nie
Koordinátor: Geothermal Anywhere, s.r.o.
Počet spoluriešiteľských inštitúcií: 0

Čerpané financie:

MŠ: 127812 €

Dosiahnuté výsledky:

- 1/ KORENKO M., PRIŠČÁK J. Elektrická vodivosť tavenín na báze $\text{Na}_3\text{AlF}_6\text{-SiO}_2$. In Silikátnik, 2012, p. 76-86.
- 2/ NERÁD I., PROKS I., ELIÁŠOVÁ M., VASKOVÁ Z., Kinetika termického rozkladu magnezitu v podmienkach intenzívneho ohrevu. In Silikátnik, 2012, p. 8-16.
- 3/ PAVLÍK V., BOČA M., Úvod do problematiky vysokoteplotných vlastností hornín pre technológie hlbinných vrtov. In Silikátnik, 2012, p. 17-22
- 4/ VASKOVÁ Z., ŠPYRKOVÁ E., KUBÍKOVÁ B., GURIŠOVÁ V., BOČA M., Diferenciálna termická analýza K_2ZrF_6 . In Interakcie tavenín s progresívnymi anorganickými materiálmi, 4. odborný seminár, 29.-30. október 2013, zborník príspevkov, Eds. J. Híveš, P. Fellner, M. Ambrová, Bratislava STU FCHPT, 2013, p. 95-102
- 5/ PAVLÍK V., BOČA M., LENDVAYOVÁ S., Thermal stability of lithium disilicate systems. In Preparation of ceramic materials. Xth international conference, 18-20th june, 2013, proceedings, Košice, Technical University of Košice, 2013, p. 86-87

28.) Univerzitný vedecký park STU Bratislava (*University Science Park of STU Bratislava*)

Zodpovedný riešiteľ: Miroslav Boča
Trvanie projektu: 1.2.2013 / 31.1.2015
Evidenčné číslo projektu: 26240220084
Organizácia je koordinátorom projektu: nie
Koordinátor: Slovenská technická univerzita v Bratislave
Počet spoluriešiteľských inštitúcií: 2 - Slovensko: 2
Čerpané financie:

29.) Kompetenčné centrum pre nové materiály, pokročilé technológie a energetiku

Zodpovedný riešiteľ: Karol Fröhlich
Zodpovedný riešiteľ v organizácii SAV: Miroslav Boča
Trvanie projektu: 1.6.2011 / 30.9.2014
Evidenčné číslo projektu: 26240220073
Organizácia je koordinátorom projektu: nie
Koordinátor:
Počet spoluriešiteľských inštitúcií: 14 - Slovensko: 14
Čerpané financie:

Dosiahnuté výsledky:

VASKOVÁ Z., ŠPYRKOVÁ E., KUBÍKOVÁ B., DTA-TG štúdia K_2ZrF_6 . In Silikátnik, 2012, p. 87-94.

30.) Centrum excelentnosti pre keramiku, sklo a silikátové materiály (*Center of Excellence for Ceramics, glass and silicate materials*)

Zodpovedný riešiteľ: Dušan Galusek
Trvanie projektu: 1.6.2010 / 31.5.2013
Evidenčné číslo projektu: ITMS 262 201 20056
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 2 - Slovensko: 2
Čerpané financie: MŠ: 231492 €

Dosiahnuté výsledky:

V rámci projektu sa obstarala a nainštalovala všetka prístrojová technika plánovaná v projekte, ktorá sa začala intenzívne využívať. Pripravili sa tiež zriaďovacie dokumenty centra, ako samostatnej organizačnej jednotky v rámci partnerských inštitúcií ÚACh SAV, TnUAD a UMV SAV. V rámci centra vzniklo viacero publikácií a príspevkov na konferenciách.

31.) Efektívne riadenie výroby a spotreby energie z obnoviteľných zdrojov - ENERGOZ

(Effective control of production and consumption of energy from renewable sources - ENERGOZ)

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| Zodpovedný riešiteľ: | Marián Janek |
| Zodpovedný riešiteľ v organizácii SAV: | Jaroslav Sedláček |
| Trvanie projektu: | 1.4.2010 / 31.3.2013 |
| Evidenčné číslo projektu: | ITMS kód: 26240220028 |
| Organizácia je koordinátorom projektu: | nie |
| Koordinátor: | Technologický inštitút SAV |
| Počet spoluriešiteľských inštitúcií: | 5 - Slovensko: 5 |
| Čerpané financie: | MŠ: 45571 € |

Dosiahnuté výsledky:

V rámci projektu boli realizované aktivity súvisiace so (i) materiálmi s luminiscenčnými vlastnosťami a (ii) využívaním fluoridových tavenín ako teplotnosného média vo výmenníkoch.

(i) Optimalizovala sa príprava ternárnych nitridov MgSiN_2 a LaSi_3N_5 zo zmesí $\text{Mg}_2\text{Si/Si/Si}_3\text{N}_4$ a $\text{LaSi/Si/Si}_3\text{N}_4$. Východiskové zmesi boli dopované oxidmi Eu_2O_3 alebo CeO_2 v obsahoch do 6 mol%. Luminofór $\text{MgSiN}_2\text{:Eu}$ emitoval červené svetlo a luminofóry $\text{LaSi}_3\text{N}_5\text{:Eu}$ a $\text{MgSiN}_2\text{:Ce}$ emitovali žiarenie v oblasti viditeľného zeleného svetla. Z SiAlOC polymérneho prekursoru bol pripravený luminofór na báze O-sialonu dopovaného Eu_2O_3 , ktorý po excitácii UV žiarením emitoval žlté svetlo. Taktiež prebiehala optimalizácia prípravy ternárnych nitridov MgSiN_2 a LaSi_3N_5 zo zmesí $\text{Mg}_2\text{Si/Si/Si}_3\text{N}_4$ a $\text{LaSi/Si/Si}_3\text{N}_4$, dopovaných oxidom samária v koncentračnom rozsahu 1 - 6 mol%. Zároveň s prebiehajúcimi experimentami boli na základe Ab initio výpočtových metód overované získané poznatky excitácie žiarenia ternárnych nitridov dopovaných oxidmi európie a skandia, a boli modelované vlastnosti nitridov dopovaných oxidom samária.

(ii) V súlade s plánovanou činnosťou bolo v tejto aktivite sledované korózne správanie sa ocelí a zliatin v rôznych taveninách. V prípade zliatiny Incoloy 800H/HT bola skúmaná korózia v tavenine (LiF-NaF-KF)eut, s prídavkom CrF_3 , FeF_3 , FeF_2 a NiF_2 v rôznych pomeroch pri teplotách 650°C. Zistilo sa, že korózna odolnosť klesá s vyšším prídavkom solí do taveniny. Z analýz testovanej zliatiny pomocou SEM-EDX bolo zistené, že prídavok solí do taveniny má za následok vyšší úbytok chrómu a železa zo zliatiny. Na povrchu sa vytvára zvyšková niklová matrica, ktorá má výrazne vyššiu odolnosť voči použitému druhu taveniny. V tomto období boli vykonávané aj testy korózie na koróziivzdornej oceli triedy AISI 304 v pripravených dusičnato-dusitanových zmesiach pri teplote 200 °C po dobu 8, 24, 48, 72 a 100 hodín. Primárne bol sledovaný hmotnostný úbytok oceli a korózne napádanie materiálu pomocou optického mikroskopu. Výsledky sú momentálne v procese spracovania a doplnenia pomocou analýz chemického a fázového zloženia.

Okrem koróznych testov bola na základe rešerše a štúdií fázových diagramov zvolená dusičnato-dusitanová zmes ako náplň pre zariadenie na uchovávanie prebytkového tepla zo Smart Gridu. Vhodnosť zmesi bola skúmaná pomocou metód termickej analýzy. Z výsledkov vyplýva, že zvolená zmes má nižšiu teplotu topenia (76,7 °C) ako komerčne dostupné dusičnanové zmesi a je teda vhodnou zmesou na tepelný transport. Pre svoj ďalší teplotný efekt pri 122,2 °C je vhodná aj na uchovávanie získaného prebytkového tepla v stacionárnych tepelných zásobníkoch. Získané údaje boli použité pre chemicko-inžiniersky výpočet parametrov zásobníka tepla.

Publikácie:

1/ IBRAHIM I., LENČEŠ Z., BENCO Ľ., ŠAJGALÍK P., Samarium-doped LaSi_3N_5 : computed electronic structure and band gaps. In Zborník odborného seminára PRÍPRAVA A VLASTNOSTI PROGRESÍVNYCH KERAMICKÝCH MATERIÁLOV, p. 35-37; Ed. J. Valúchová, ISBN 978-80-971499-4-9; 18. – 19. November 2013, Ružín

2/ IBRAHIM I., LENČEŠ Z., BENCO Ľ., HRABALOVÁ M., ŠAJGALÍK P., Cerium-doped LaSi_3N_5 : computed electronic structure and band gaps. J. Eur. Ceram. Soc., accepted, Ref. No.: JECS-9492, DOI: 10.1016/j.jeurceramsoc.2013.12.054.

3/ IBRAHIM I., LENČEŠ Z., BENCO Ľ., HRABALOVÁ M., ŠAJGALÍK P., Samarium-doped LaSi_3N_5 : synthesis, computed electronic structure and band gaps. J. Am. Ceram. Soc., accepted, Ref. No. JACERS-34339

4/ LENČEŠ Z., HRABALOVÁ M., IBRAHIM I., BENCO Ľ., ŠAJGALÍK P., HIRAO K., Influence of Eu, Ce and Sm dopants on the electronic structure and photoluminescence of MgSiN_2 and LaSi_3N_5 -based phosphors. In ACTSEA 2013. 4th International symposium on advanced ceramics and technology, November 10-13, 2013. - Taipei, Taiwan,

2013, p. 88-89.

5/ ŠAJGALÍK P., LENČEŠ Z., MICHÁLKOVÁ M., ZHOU Y., HIRAO K., Ternary silicon nitrides - from engineering to phosphors. In ACTSEA 2013. 4th International Symposium on Advanced Ceramics and Technology, November 10-13, 2013 Taipei, Taiwan, p. 84-85.

32.) Centrum aplikovaného výskumu nových materiálov a transferu technológií

Zodpovedný riešiteľ: Jaromír Pastorek
Zodpovedný riešiteľ v organizácii SAV: Miroslav Boča
Trvanie projektu: 1.3.2013 / 31.3.2015
Evidenčné číslo projektu: ITMS 26240220088
Organizácia je koordinátorom projektu: nie
Koordinátor:
Počet spoluriešiteľských inštitúcií: 2 - Slovensko: 2
Čerpané financie:

Dosiahnuté výsledky:

33.) Generátor vysokoprúdovej plazmy na báze kompozitných materiálov pre účely gazifikácie pevných uhlovodíkov - PLASMAT. (*High-flow plasma generator based on composite materials for gasification of solid hydrocarbons - PLASMAT.*)

Zodpovedný riešiteľ: Jaroslav Sedláček
Trvanie projektu: 1.10.2010 / 31.3.2013
Evidenčné číslo projektu: ITMS 26240220054
Organizácia je koordinátorom projektu: nie
Koordinátor: CELIM Slovakia
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: MŠ: 29640 €

Dosiahnuté výsledky:

Na základe získaných poznatkov a výsledkov skúmania keramických materiálov a ich kompozitov sú pre konštrukciu generátora vysokoprúdovej plazmy ako najvhodnejšie keramické materiály na báze Al₂O₃, ktoré sa vyznačujú dobrými mechanickými vlastnosťami ako tvrdosť na úrovni 17 GPa, pevnosť ~ 400 MPa a najmä chemická stálosť. Nevýhodou korundovej keramiky je však nízka lomová húževnatosť a odolnosť voči teplotným šokom. Najmä táto vlastnosť limituje použitie takéhoto materiálu v konštrukcii plazmového generátora, kde môže dochádzať lokálne k vysokým prehriatiam a následnému ochladeniu. Zvýšenie odolnosti voči teplotným šokom bola dosiahnutá prídavkom 5 obj. % uhlíkových nanorúrok pri zachovaní ostatných vlastností ako pevnosť, chemická stálosť.

Ďalšími vhodnými kandidátmi pre danú aplikáciu sa na základe riešenia javí materiál zo systému ZrB₂ – (10-20 obj. %) SiC, ZrB₂ – Si₃N₄, TiB₂ – TiC, SiC – Ti – NbC, ktoré okrem aplikačných vlastností popísaných pre Al₂O₃ – CNT sa vyznačujú aj vyššou elektrickou vodivosťou. Ich praktické využitie pri konštrukcii plazmového generátora by však bolo potrebné otestovať detailnejšie. Rovnako by bolo potrebná detailnejšia analýza chemickej odolnosti voči prostrediu v akom by mal byť generátor použitý. Chemická stálosť, odolnosť voči korózii, ostatných materiálov ako Si₃N₄-Y₂O₃-AlN a SiC-Al₂O₃-Y₂O₃ skúmaných taktiež v rámci aktivity projektu nebola dostatočná pre použitie.

Publikácie:

- 1/ MICHÁLKOVÁ M., LENČEŠ Z., MICHÁLEK M., KOCHER P., Kübler J., ŠAJGALÍK P., Improvement of electrical conductivity of silicon nitride/carbon nano-fibers composite using magnesium silicon nitride and ytterbium oxide as sintering additives. In Journal of the European Ceramic Society, 2013, 33, p. 2429-2434
- 2/ MICHÁLEK M., BODIŠOVÁ K., MICHÁLKOVÁ M., SEDLÁČEK J., GALUSEK D., Alumina/MWCNTs composites by aqueous slip casting and pressureless sintering. In Ceramics International, 2013, 39, p. 6543-6550.
- 3/ PARCHOVIANSKY M., GALUSEK D., SEDLÁČEK J., ŠVANČÁREK P., KAŠIAROVÁ M., DUSZA J., Microstructure and mechanical properties of hot pressed Al₂O₃/SiC nanocomposites. In Journal of the European Ceramic Society, 2013, 33, p. 2291-2298.

34.) Priemyselný výskum pre potreby zefektívnenia unikátnej technológie tavenia a tvarovania úžitkového skla - PVTECHSKLO (*Industrial research for needs of the reengineering of the unique technology of the glass preparation and the forming work - PVTECHSKLO*)

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| Zodpovedný riešiteľ: | Peter Šimurka |
| Trvanie projektu: | 1.4.2010 / 31.3.2014 |
| Evidenčné číslo projektu: | ITMS kód: 26220220072 |
| Organizácia je koordinátorom projektu: | nie |
| Koordinátor: | RONA, a. s. |
| Počet spoluriešiteľských inštitúcií: | 1 - Slovensko: 1 |
| Čerpané financie: | MŠ: 46136 € |

Dosiahnuté výsledky:

V aktivite Priemyselný výskum nového spôsobu a technologických postupov tavenia skla boli zmluvne uzatvorené spolupráce formou zmluvného výskumu s SSV Murano Taliano a Glass Service Vsetín. SEM a EDX analýzou sa doplnil súbor študovaných žiaromateriálov a rozšírila sa databáza nehomogenít vyskytujúcich sa pri výrobe úžitkového skla. Určili sa hlavné typy vád a ich potenciálny zdroj. Získané výsledky boli prezentované v prácach:

- 1/ CHROMČÍKOVÁ M., LISSOVÁ M., MOŠNER P., RÖSSLEROVÁ I., LIŠKA, M., KOUDELKA L., Viscosity and activation energy for viscous flow of PbO-WO₃-P₂O₅ glasses. In Physics and Chemistry of Glasses: European Journal of Glass Science and Technology Part B, 2013, vol. 54, no. 3, p. 129-132.
- 2/ ZEMANOVÁ V., PLŠKO A., LIŠKA M., CHROMČÍKOVÁ M., KARELL R., PAGÁČOVÁ J., Kryštalizácia skiel sústavy Na₂O-CaO-ZrO₂-SiO₂. Mezinárodní český a slovenský kalorimetrický seminář, Třeboň, 131-134, 2013
- 3/ ŠIMURKA P., KRAXNER J., KLEMENT R., SEDLÁČEK J., Refractory corrosion in a tableware glass melt. In Preparation of ceramic materials. Xth international conference, 18-20th june, 2013 : proceedings. Technical University of Košice, 2013, p. 12-13.
- 4/ ŠIMURKA P., KRAXNER J., VRABEL P., PAUČO T.: Cords at the tableware glass melting – composition and potential sources, The 23rd International Congress on Glass, Praha, Česká republika, 1.-5. júl 2013
- 5/ P. ŠIMURKA, J. SEDLÁČEK, J. KRAXNER: Study of Al₂O₃-ZrO₂-SiO₂ (AZS) refractory material corrosion in industrially tableware glass melt, The 10th Pacific Rim Conference on Ceramic and Glass Technology, San Diego, USA June 2-7, 2013

35.) Znalostná databáza a expertný systém environmentálneho riešenia havárií straty chladiva v prevádzke jadrovej elektrárne - ZDESJE. (*Knowledge database and expert system for environmental friendly solutions of loss of coolant accidents in atomic nuclear power plants - ZDESJE.*)

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|---|----------------------|
| Zodpovedný riešiteľ: | Peter Šimurka |
| Trvanie projektu: | 1.4.2010 / 31.3.2014 |
| Evidenčné číslo projektu: | ITMS 26220220072 |
| Organizácia je koordinátorom projektu: | nie |
| Koordinátor: | VÚEZ, a.s. |
| Počet spoluriešiteľských inštitúcií: | 1 - Slovensko: 1 |
| Čerpané financie: | MŠ: 124571 € |

Dosiahnuté výsledky:

V rámci doterajšieho riešenia projektu sa na pracovisku partnera získali informácie o kinetike korózie troch druhov sklovlnatej izolácie roztokmi chladiva používaného v kombinácii s jednotlivými druhmi izolácie v jadrových elektrárňach. Pri rôznych teplotách sa realizovali a vyhodnotili statické a prietokové korózne testy v destilovanej vode (ako referenčnom médiu) a v roztoku chladiva. Okrem sklovlnatej izolácie sa pri testoch použila sklená drvina s rovnakým oxidovým zložením ako sklenené vlákna pripravená z objemových vzoriek skla získaných laboratórnymi tavbami.

Prezentácia výsledkov projektu na medzinárodných konferenciách:

CHROMČÍKOVÁ M., TEPLANOVÁ M., LIŠKA M.: Vybrané fyzikálne vlastnosti oxidových skiel určených na vitrifikáciu chrompiku. 35. Mezinárodní český a slovenský kalorimetrický seminář.

FATURÍKOVÁ K., VLČKOVÁ P., KAŇKOVÁ H., CHROMČÍKOVÁ M., SOLTÉSZ V., LIŠKA M., Kinetic model of 725 QN glass leaching under static conditions in distilled water and in borate coolant solution. 23rd International Congress on Glass.

KAŇKOVÁ H., VLČKOVÁ P., FATURÍKOVÁ K., CHROMČÍKOVÁ M., SOLTÉSZ V., LIŠKA M., The thermodynamic model of leaching of 725 QN glass in distilled water and borate coolant solution. In ICG Prague 2013. The 23rd international congress on glass, july 1-5, 2013 : book of abstracts, Vydavatelství České sklářské společnosti s.r.o., 2013, p. 296.

MICHÁLKOVÁ J., VLČKOVÁ P., FATURÍKOVÁ K., KAŇKOVÁ H., VOKELOVÁ J., CHROMČÍKOVÁ M., SOLTÉSZ V., LIŠKA M., Kinetics of leaching of 725 QN glass grains under flow-through conditions in distilled water and in borate coolant solution. 23rd International Congress on Glass.

SOLTÉSZ, Vojtech - VLČKOVÁ, Patrícia - FATURÍKOVÁ, Katarína - KAŇKOVÁ, Hana - CHROMČÍKOVÁ, Mária - LIŠKA, Marek: Corrosion of IZOMER TT carded E-glass fibers in borate water solution. 23rd International Congress on Glass.

VLČKOVÁ P., FATURÍKOVÁ K., KAŇKOVÁ H., CHROMČÍKOVÁ M., SOLTÉSZ V., LIŠKA M., Kinetics of leaching of 725 QN glass fibers under static conditions in distilled water and in borate coolant solution. 23rd International Congress on Glass.

VOKELOVÁ J., VLČKOVÁ P., FATURÍKOVÁ K., KAŇKOVÁ H., MICHÁLKOVÁ J., CHROMČÍKOVÁ M., SOLTÉSZ V., LIŠKA M., Kinetics of leaching of 725 QN glass fibers under flow-through conditions in distilled water in borate coolant solution. 23rd International Congress on Glass.

LIŠKA M., CHROMČÍKOVÁ M., KAŇKOVÁ H., VLČKOVÁ P., FATURÍKOVÁ K., SOLTÉSZ V.: Kinetics and thermodynamics of glass fibrous insulation corrosion by the coolant solution – building a kinetic model from experimental data. 23rd International Congress on Glass.

CHROMČÍKOVÁ M., LIŠKA M., GAVENDA T., MACHÁČEK J., Structure of Na₂O-MgO-CaO-SiO₂ glasses by combined Raman spectroscopy and thermodynamic modelling approach. 2nd Central and Eastern European Conference on Thermal Analysis and Calorimetry.

CHROMČÍKOVÁ M., LIŠKA M., MACHÁČEK J., CHOVANEC J., Thermodynamic model and selected physical properties of Na₂O-MgO-CaO-SiO₂ glasses. Society of Glass Technology “Living Glass” Conference 2013.

CHROMČÍKOVÁ M., LIŠKA M., LISSOVÁ M., GAVENDA T., PCA analysis of Raman spectra of PbO-WO₃-P₂O₅ glasses. International Days of Materials Science, Pardubice, 2013.

LIŠKA M., CHROMČÍKOVÁ M., MACHÁČEK J., Glass structure and thermodynamic models. International Days of Materials Science, Pardubice 2013

Programy: Centrá excelentnosti SAV

36.) Centrum excelentnosti pre funkcionizované viacfázové materiály (*Center of Excellence for Functionalized Multiphase Materials*)

| | |
|---|-----------------------|
| Zodpovedný riešiteľ: | Marián Krajčí |
| Zodpovedný riešiteľ v organizácii SAV: | Pavol Šajgalík |
| Trvanie projektu: | 1.8.2011 / 31.12.2014 |
| Evidenčné číslo projektu: | |
| Organizácia je koordinátorom projektu: | nie |
| Koordinátor: | |
| Počet spoluriešiteľských inštitúcií: | 5 - Slovensko: 5 |
| Čerpané financie: | MŠ: 4152 € |

Dosiahnuté výsledky:

Z polymérneho prekursoru na báze SiAlOC pripraveného zo zmesi poly-metylsilsesquioxánu, alkoxidu hliníka a Eu₂O₃ bol pripravený svetlo emitujúci lumínofor. Po optimalizácii podmienok spekania a následného vysokoteplotného žihania sa podarilo pripraviť lumínofor emitujúci oranžové svetlo.

Použitím nitridových a oxidových prísad spekania (MgSiN₂/Yb₂O₃) na zhutnenie Si₃N₄ keramiky a prídavkom uhlíkových nanovláken (CNFs – carbon nanofibers) bol pripravený kompozit Si₃N₄/CNFs s elektrickou vodivosťou 1315 S/m. V porovnaní s ostatnými publikovanými prácami v tomto prípade mechanické vlastnosti neboli degradované prídavkom CNFs. Ďalšou výhodou aplikácie MgSiN₂ ako prísady spekania je možnosť použitia nižšej teploty spekania (1500 °C).

Vysokoenergetickým mletím aktivovaný karbonitridový prášok na báze Ti_{0.9}Ta_{0.1}Co_{0.5}N_{0.5}/Co bol zhutnený

žiarovým lisovaním v zmesnej atmosfére dusíka a argónu. Optimalizáciou podmienok spekania sa podarilo pripraviť kompozit s vysokou tvrdosťou 22,4 GPa (lomová húževnatosť 5,7 MPa·m^{1/2}), alebo vysokou lomovou húževnatosťou 10,3 MPa·m^{1/2} (tvrdosť 16,5 GPa).

Publikácie:

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2/ MICHÁLKOVÁ M., LENČEŠ Z., MICHÁLEK M., KOCHER P., KUEBLER J., ŠAJGALÍK P., Improvement of electrical conductivity of silicon nitride/carbon nano-fibers composite using magnesium silicon nitride and ytterbium oxide as sintering additives. In Journal of the European Ceramic Society, 2013, vol. 33, no. 13-14, p. 2429-2434.

Príloha C - Publikačná činnosť organizácie (zoraďená podľa kategórií)

ABC Kapitoly vo vedeckých monografiách vydané v zahraničných vydavateľstvách

- ABC01 KOMADEL, Peter - MADEJOVÁ, Jana. Acid activation of clay minerals. In Handbook of Clay Science. A.Fundamentals. Second edition. - Oxford : Elsevier, 2013, p. 385-410. ISBN 978-0-08-098259-5. ISSN 1572-4352.
- ABC02 PETIT, Sabine - MADEJOVÁ, Jana. Fourier transform infrared spectroscopy. In Handbook of Clay Science. B.Techniques and Applications. Second edition. - Oxford : Elsevier, 2013, p. 213-232. ISBN 978-0-08-098258-8. ISSN 1572-4352.

ADCA Vedecké práce v zahraničných karentovaných časopisoch impaktovaných

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- ADCA04 BODIŠOVÁ, Katarína - KAŠIAROVÁ, Monika - DOMANICKÁ, Magdaléna - HNATKO, Miroslav - LENČEŠ, Zoltán - VARCHULOVÁ NOVÁKOVÁ, Zuzana - VOJTAŠŠÁK, Ján - GROMOŠOVÁ, Silvia - ŠAJGALÍK, Pavol. Porous silicon nitride ceramics designed for bone substitute applications. In Ceramics International, 2013, vol. 39, p. 8355-8362. (1.789 - IF2012). (2013 - Current Contents, WOS, SCOPUS). ISSN 0272-8842.
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- ADCA15 CHROMČÍKOVÁ, Mária - LIŠKA, Marek - LISSOVÁ, Magdaléna - MOŠNER, Petr - KOUDELKA, Ladislav. Structural relaxation of $\text{PbO-WO}_3\text{-P}_2\text{O}_5$ glasses. In *Journal of Thermal Analysis and Calorimetry*, 2013, vol. 114, no. 3, p. 947-954. (1.982 - IF2012). (2013 - Current Contents). ISSN 1388-6150.
- ADCA16 CHROMČÍKOVÁ, Mária - LIŠKA, Marek - GAŠPÁREKOVÁ, Eleonóra - TEPLANOVÁ, Magdaléna - KARELL, Radovan. Thermodynamic model and viscosity of selected zirconia containing silicate glasses. In *Ceramics-Silikáty*, 2013, vol. 57, no. 1, p. 66-73. (0.418 - IF2012). (2013 - Current Contents). ISSN 0862-5468.
- ADCA17 CZÍMEROVÁ, Adriana - JANKOVIČ, Ľuboš - MADEJOVÁ, Jana - ČEKLOVSKÝ, Alexander. Unique photoactive nanocomposites based on rhodamine 6G/polymer/montmorillonite hybrid systems. In *Journal of Polymer Science. Part B. Polymer Physics*, 2013, vol. 51, p. 1672-1679. (2.221 - IF2012). (2013 - Current Contents). ISSN 0887-6266.
- ADCA18 DANKO, Martin - MIČUŠÍK, Matej - OMASTOVÁ, Mária - BUJDÁK, Juraj - CHORVÁT, Dušan Jr. Spectral characterisation of new organic fluorescent dyes with an alkoxysilane moiety and their utilisation for the labelling of layered silicates. In *Chemical papers*, 2013, vol. 67, no. 1, p. 18-28. (0.879 - IF2012). (2013 - Current Contents). ISSN 0366-6352 Print.
- ADCA19 DEMEL, Ondřej - KEDŽUCH, Stanislav - NOGA, Jozef - PITTNER, Jiří. Perturbative triples correction for explicitly correlated Mukherjee's state-specific coupled cluster method. In *Molecular Physics*, 2013, vol. 111, no. 16-17, p. 2477-2488. (1.670 - IF2012). (2013 - Current Contents). ISSN 0026-8976.
- ADCA20 DIMOS, Konstantinos - JANKOVIČ, Ľuboš - KOUTSELAS, Ioannis -

- KARAKASSIDES, M.A. - ZBORIL, Radek - KOMADEL, Peter. Low-temperature synthesis and characterization of gallium nitride quantum dots in ordered mesoporous silica. In Journal of Physical Chemistry C, 2012, vol. 116, no. 1, p. 1185-1194. (4.805 - IF2011). (2012 - Current Contents). ISSN 1932-7447.
- ADCA21 DRÁBIK, Milan - GÁLIKOVÁ, Ľubica - BILLIK, Peter - MAIER, Gunther - KOSEDNAR-LEGENSTEIN, Barbara. Macro defect free materials; mechanochemical activation of raw mixes as the intensifying tool of the entire MDF synthesis. In Ceramics-Silikáty, 2013, vol. 57, no. 2, p. 120-125. (0.418 - IF2012). (2013 - Current Contents). ISSN 0862-5468.
- ADCA22 DRÁBIK, Milan - BILLIK, Peter - GÁLIKOVÁ, Ľubica. Macro defect free materials; The challenge of mechanochemical activation. In Ceramics-Silikáty, 2012, vol. 56, no. 4, p. 396-401. (0.382 - IF2011). (2012 - Current Contents). ISSN 0862-5468.
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- ADCA25 GEDEON, Ondrej - LIŠKA, Marek. Rings in covalent glass and an evaluation of configurational entropy associated with rings. In Journal of Non-Crystalline Solids, 2013, vol. 360, p. 41-48. (1.597 - IF2012). (2013 - Current Contents, WOS, SCOPUS). ISSN 0022-3093.
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- ADCA27 HRACHOVÁ, Jana - KOMADEL, Peter - JOCHEC MOŠKOVÁ, Daniela - KRAJČI, Juraj - JANIGOVÁ, Ivica - ŠLOUF, Miroslav - CHODÁK, Ivan. Properties of organo-clay/natural rubber nanocomposites: Effects of organophilic modifiers. In Journal of Applied Polymer Science, 2013, vol. 127, p. 3447 - 3455. (1.395 - IF2012). (2013 - Current Contents). ISSN 0021-8995.
- ADCA28 JANÍK, R. - JÓNA, Eugen - PAJTÁŠOVÁ, M. - ONDRUŠOVÁ, D. - LODUHOVÁ, M. - PAVLÍK, Viliam - DURNÝ, R. - MOJUMDAR, Subhash Chandra. Effect of different dimethylphenols on the interactions with Ni²⁺-exchanged montmorillonite : Thermal, spectral, and diffraction studies. In Journal of Thermal Analysis and Calorimetry, 2013, vol. 112, p. 1053-1058. (1.982 - IF2012). (2013 - Current Contents). ISSN 1388-6150.
- ADCA29 JANÍK, R. - JÓNA, Eugen - PAVLÍK, Viliam - LIZÁK, P. - MOJUMDAR, Subhash Chandra. Interactions of 2,5- and 3,5-dimethylphenols with co-exchanged montmorillonite : Thermal, IR-spectral and X-ray studies. In Journal of Thermal Analysis and Calorimetry, 2013, vol. 112, p. 1083-1087. (1.982 - IF2012). (2013 - Current Contents). ISSN 1388-6150.
- ADCA30 KOMOROVSKÝ, Stanislav - REPISKÝ, Michal - RUUD, Kenneth - MALKINA, Oľga - MALKIN, Vladimír. Four-component relativistic density functional theory calculations of NMR shielding tensors for paramagnetic systems. In Journal of Physical Chemistry A.Molecules, spectroscopy, kinetics, environment, and general theory, 2013, vol. 117, no. 51, p. 14209-14219. (2.771 - IF2012). (2013 - Current Contents). ISSN 1089-5639.
- ADCA31 KORENKO, Michal - STRAKA, Martin - SZATMÁRY, Lórant - AMBROVÁ, M. -

- UHLÍŘ, J. Electrochemical separation of uranium in the molten system LiF-NaF-KF-UF₄. In *Journal of Nuclear Materials*, 2013, vol. 440, p. 332-337. (1.211 - IF2012). (2013 - Current Contents). ISSN 0022-3115.
- ADCA32 KORENKO, Michal - PRIŠČÁK, Jozef - ŠIMKO, František. Electrical conductivity of the systems based on Na₃AlF₆-SiO₂ melt. In *Chemical Papers*, 2013, vol. 67, no. 10, p. 1350-1354. (0.879 - IF2012). (2013 - Current Contents). ISSN 0366-6352.
- ADCA33 KOVALČÍKOVÁ, Alexandra - DUSZA, Ján - ŠAJGALÍK, Pavol. Influence of the heat treatment on mechanical properties and oxidation resistance of SiC-Si₃N₄ composites. In *Ceramics International*, 2013, vol. 39, p. 7951-7957. (1.789 - IF2012). (2013 - Current Contents, WOS, SCOPUS). ISSN 0272-8842.
- ADCA34 KŘÍSTKOVÁ, Anežka - ASHER, James Richard - MALKIN, Vladimír - MALKINA, Olga. Indirect nuclear (15)N-(15)N scalar coupling through a hydrogen bond: dependence on structural parameters studied by quantum chemistry tools. In *Journal of Physical Chemistry A. Molecules, spectroscopy, kinetics, environment, and general theory*, 2013, vol. 117, no. 38, p. 9235-9244. (2.771 - IF2012). (2013 - Current Contents). ISSN 1089-5639.
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1. [1.2] OELGARDT, C. - GÜNSTER, J. - HEINRICH, J.G. Characterization of the crystallization behavior of laser-fused transparent microspheres with the eutectic composition $\text{Al}_2\text{O}_3\text{-Y}_2\text{O}_3\text{-ZrO}_2$ (AYZ). In *Journal of Ceramic Science and Technology*, 2011, 2, 2, pp. 103-110., SCOPUS

ADF Vedecké práce v dom. nekarent. časopisoch a ostatných zborníkoch

- ADF01 TRTÍKOVÁ, Stanislava - MADEJOVÁ, Jana - KUŠNIEROVÁ, Mária - CHOVAN, Martin. Precipitation and chemical composition of iron ochres in the pyrite and stibnite deposits in the Malé Karpaty Mts. In *Slovak Geological Magazine*, 1999, roč. 5, č. 3, s. 179-186. ISSN 1335-096X.

Citácie:

1. [3] ĎUŽA, R. - OZDÍN, D. *Minerály Slovenska. Praha, Granit*, 2012, 480 s.

AEC Vedecké práce v zahraničných recenzovaných vedeckých zborníkoch (aj konferenčných), monografiách

- AEC01 LENČEŠ, Zoltán - HIRAO, Kiyoshi - HOFFMANN, M.J. - KANZAKI, Shuzo. Fluorine-doped reaction bonded MgSiN_2 . In *EURO CERAMICS VIII. PTS 1-3*. Eds. H. Mandal, L. Ovecoglu. - 2004, p. 865-868. ISBN 0-87849-946-6. ISSN 1013-9826.

Citácie:

1. [1.1] ANDRADE, Miria - DZIVENKO, Dmytro - MIEHE, Gerhard - BOEHLER, Reinhard - HINTZEN, Hubertus T. - RIEDEL, Ralf. High-pressure high-temperature synthesis and structure of $\beta\text{-MgSiN}_2$. In *PHYSICA STATUS SOLIDI-RAPID RESEARCH LETTERS*. ISSN 1862-6254, 2011, vol. 5, no. 5-6, pp. 196., WOS

- AEC02 MICHÁLKOVÁ, Monika - GHILLÁNYOVÁ, Katarína - GALUSEK, Dušan. Standard and two-stage sintering of a submicrometer alumina powder: The influence on the sintering trajectory. In *International Conference on Sintering*, 16.11. - 20.11.2009 : *Ceramics Transactions vol. 209: Advances in Sintering Science and Technology*. - La Jolla, 2009, p. 421-427. ISBN 978-0-470-40849-0.

Citácie:

1. [1.1] WU, Ming-Wei. Two-step sintering of aluminum-doped zinc oxide sputtering target by using a submicrometer zinc oxide powder. In *CERAMICS INTERNATIONAL*. ISSN 0272-8842, 2012, vol. 38, no. 8, pp. 6229., WOS

- AEC03 SEDLÁČEK, Jaroslav - GALUSEK, Dušan - ŠVANČÁREK, Peter - BROWN, Andy - BRYDSON, R. Alumina-carbon composites with high hardness. In *EURO CERAMICS VIII. PTS 1-3*. Eds. H. Mandal, L. Ovecoglu. - 2004, p. 841-844. ISBN 0-87849-946-6. ISSN 1013-9826.

Citácie:

1. [1.1] YAHYA, Noor A. - TODD, Richard I. Influence of C doping on the fracture mode and abrasive wear of Al_2O_3 . In *JOURNAL OF THE EUROPEAN CERAMIC SOCIETY*. ISSN 0955-2219, 2012, vol. 32, no. 16, pp. 4003., WOS

Príloha D - Údaje o pedagogickej činnosti organizácie

Semestrálne prednášky:

doc. Ing. Miroslav Boča, PhD.

Názov semestr. predmetu: Teória chemickej väzby

Počet hodín za semester: 20

Názov katedry a vysokej školy: Univerzita Konštantína Filozofa v Nitre, Fakulta prírodných vied, Katedra chémie

doc. Ing. Miroslav Boča, PhD.

Názov semestr. predmetu: Všeobecná chémia

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Konštantína Filozofa v Nitre, Fakulta prírodných vied, Katedra chémie

prof. RNDr. Jozef Noga, DrSc.

Názov semestr. predmetu: Topics in Current Chemistry

Počet hodín za semester: 12

Názov katedry a vysokej školy: Uniwersytet Śląski Katowice, Poľsko, Instytut Chemii

Semestrálne cvičenia:

Mgr. Valéria Bizovská

Názov semestr. predmetu: Všeobecná a anorganická chémia – laboratórne cvičenia

Počet hodín za semester: 52

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Anna Brtáňová, PhD.

Názov semestr. predmetu: Laboratórna technika

Počet hodín za semester: 104

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Magdaléna Domanická

Názov semestr. predmetu: Laboratórne cvičenia zo všeobecnej a anorganickej chémie

Počet hodín za semester: 52

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Mária Kádek

Názov semestr. predmetu: Teoretická mechanika

Počet hodín za semester: 26

Názov katedry a vysokej školy: Univerzita Komenského v Bratislave, Katedra teoretickej fyziky a didaktiky fyziky (KTFDF)

Ing. Martin Kontrík

Názov semestr. predmetu: Všeobecná a anorganická chémia – laboratórne cvičenia

Počet hodín za semester: 52

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

prof. RNDr. Jozef Noga, DrSc.

Názov semestr. predmetu: Topics in Current Chemistry

Počet hodín za semester: 48

Názov katedry a vysokej školy: Uniwersytet Śląski Katowice, Poľsko, Instytut Chemii

Ing. Viliam Pavlík, PhD.

Názov semestr. predmetu: Anorganická chémia materiálov

Počet hodín za semester: 32

Názov katedry a vysokej školy: Fakulta priemyselných technológií TnUAD v Púchove, Katedra materiálového inžinierstva

Mgr. Lukáš Petra

Názov semestr. predmetu: Všeobecná a anorganická chémia

Počet hodín za semester: 52

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Ing. Samuel Sas

Názov semestr. predmetu: LABORATÓRNE CVIČENIE Z ANORGANICKEJ CHÉMIE I

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Oddelenie anorganickej chémie ÚACHTM

Ing. Samuel Sas

Názov semestr. predmetu: LABORATÓRNE CVIČENIE Z ANORGANICKEJ CHÉMIE I

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Oddelenie anorganickej chémie ÚACHTM

Ing. Ľudmila Sekeráková

Názov semestr. predmetu: LABORATÓRNE CVIČENIE Z ANORGANICKEJ CHÉMIE I

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, ODDELENIE ANORGANICKEJ CHÉMIE (OACH ÚATM FCHPT)

Ing. Ľudmila Sekeráková

Názov semestr. predmetu: LABORATÓRNE CVIČENIE Z ANORGANICKEJ CHÉMIE II

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, ODDELENIE ANORGANICKEJ CHÉMIE (OACH ÚATM FCHPT)

Ing. Michal Šimurda

Názov semestr. predmetu: Laboratórne cvičenie z anorganickej chémie I

Počet hodín za semester: 52

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Oddelenie anorganickej chémie

Semináre:

doc. Ing. Miroslav Boča, PhD.

Názov semestr. predmetu: Seminár z teórie chemickej väzby

Počet hodín za semester: 20

Názov katedry a vysokej školy: Univerzita Konštantína Filozofa v Nitre, Fakulta prírodných vied, Katedra chémie

Mgr. Stanislav Kedžuch, PhD.

Názov semestr. predmetu: Výpočtový seminár I

Počet hodín za semester: 72

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Stanislav Kedžuch, PhD.

Názov semestr. predmetu: Výpočtový seminár II

Počet hodín za semester: 24

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

prof. RNDr. Jozef Noga, DrSc.

Názov semestr. predmetu: Selected Topics in General Chemistry

Počet hodín za semester: 60

Názov katedry a vysokej školy: Uniwersytet Śląski Katowice, Poľsko, Instytut Chemii

Mgr. Lukáš Petra

Názov semestr. predmetu: Všeobecná a anorganická chémia

Počet hodín za semester: 52

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Terénne cvičenia:

Individuálne prednášky:

doc. RNDr. Milan Drábik, CSc.

Názov semestr. predmetu: Erasmus lectures

Počet hodín za semester: 6

Názov katedry a vysokej školy: University of Surrey, U. K., Chemistry Department

prof. Ing. Dušan Galusek, DrSc.

Názov semestr. predmetu: Technológia pokročilých anorganických materiálov

Počet hodín za semester: 8

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Oddelenie keramiky, skla a cementu

doc. Ing. Zoltán Lenčేశ, PhD.

Názov semestr. predmetu: Nové anorganické materiály

Počet hodín za semester: 4

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. Ing. Zoltán Lenčేశ, PhD.

Názov semestr. predmetu: Technické materiály II – polymery, keramika

Počet hodín za semester: 6

Názov katedry a vysokej školy: Vysoká škola báňská - TU Ostrava, Česká republika, Fakulta metalurgie a materiálového inženýrství

Príloha E - Medzinárodná mobilita organizácie**(A) Vyslanie vedeckých pracovníkov do zahraničia na základe dohôd:**

| Krajina | D r u h d o h o d y | | | | | |
|------------|---------------------|-----------|-----------------|-----------|--------------------|-----------|
| | MAD, KD, VTS | | Medziústavná | | Ostatné | |
| | Meno pracovníka | Počet dní | Meno pracovníka | Počet dní | Meno pracovníka | Počet dní |
| Belgicko | Anna Prnová | 8 | | | | |
| Česko | | | | | Peter Boháč | 3 |
| | | | | | Juraj Bujdák | 3 |
| | | | | | Roman Bystrický | 3 |
| | | | | | Dušan Galusek | 1 |
| | | | | | Veronika Gurišová | 2 |
| | | | | | Eva Hadzimová | 2 |
| | | | | | Ondrej Hanzel | 5 |
| | | | | | Branislav Hruška | 3 |
| | | | | | Mária Chromčíková | 5 |
| | | | | | Mária Chromčíková | 5 |
| | | | | | Mária Chromčíková | 3 |
| | | | | | Mária Chromčíková | 6 |
| | | | | | Mária Chromčíková | 6 |
| | | | | | Ľuboš Jankovič | 3 |
| | | | | | Ľuboš Jankovič | 3 |
| | | | | | Stanislav Kedžuch | 12 |
| | | | | | Martin Kontrík | 3 |
| | | | | | Michal Korenko | 2 |
| | | | | | Michal Korenko | 3 |
| | | | | | Jozef Kraxner | 2 |
| | | | | | Marek Liška | 5 |
| | | | | | Marek Liška | 5 |
| | | | | | Martin Michálek | 3 |
| | | | | | Monika Micháľková | 3 |
| | | | | | Helena Pálková | 5 |
| | | | | | Viliam Pavlík | 3 |
| | | | | | Anna Prnová | 3 |
| | | | | | Samuel Sas | 3 |
| | | | | | Ľudmila Sekeráková | 5 |
| | | | | | Ľubomír Smrčok | 2 |
| | | | | | Ľubomír Smrčok | 3 |
| | | | | | František Šimko | 3 |
| | | | | | František Šimko | 2 |
| | | | | | Michal Šimurda | 3 |
| Čína | | | | | Michal Korenko | 16 |
| | | | | | Peter Šimurka | 6 |
| Francúzsko | | | | | James Richard | 5 |

| | | | | | |
|----------------------------|----------------|-----------|--|-------------------|------------|
| | | | | Asher | |
| | | | | Miroslav Boča | 6 |
| | | | | Peter Cherry | 5 |
| | | | | Stanislav Kedžuch | 20 |
| | | | | Michal Korenko | 6 |
| | | | | Oľga Malkin | 6 |
| | | | | Oľga Malkin | 5 |
| | | | | Vladimír Malkin | 6 |
| | | | | Vladimír Malkin | 5 |
| | | | | Vladimír Malkin | 4 |
| | | | | Jozef Noga | 7 |
| | | | | Eubomír Smrčok | 6 |
| | | | | František Šimko | 5 |
| | | | | Michal Vetrecin | 7 |
| Maďarsko | | | | Mária Chromčíková | 5 |
| Nemecko | | | | Eva Hadzimová | 6 |
| | | | | Ondrej Hanzel | 28 |
| | | | | Monika Hrabalová | 6 |
| | | | | Mária Chromčíková | 7 |
| | | | | Ismail Ibrahim | 6 |
| | | | | Blanka Kubíková | 6 |
| | | | | Jozef Noga | 3 |
| | | | | Anna Prnová | 7 |
| | | | | Michal Vetrecin | 28 |
| Nórsko | | | | Peter Cherry | 18 |
| Poľsko | Helena Pálková | 11 | | Adriana Czimerová | 7 |
| | | | | Jozef Noga | 13 |
| Rakúsko | | | | Eva Scholtzová | 5 |
| Rusko | | | | Stanislav Kedžuch | 10 |
| | | | | Michal Korenko | 22 |
| | | | | Oľga Malkin | 16 |
| | | | | Vladimír Malkin | 16 |
| Taiwan | Dušan Galusek | 11 | | Róbert Klement | 8 |
| Taliansko | | | | Monika Hrabalová | 6 |
| | | | | Ismail Ibrahim | 6 |
| Turecko | | | | Monika Hrabalová | 4 |
| | | | | Ismail Ibrahim | 4 |
| Ukrajina | Martin Kontrík | 8 | | | |
| | Viliam Pavlík | 8 | | | |
| USA | | | | Peter Komadel | 6 |
| Veľká Británia | | | | Milan Drábik | 6 |
| Počet vyslaní spolu | 5 | 46 | | 75 | 487 |

(B) Prijatie vedeckých pracovníkov zo zahraničia na základe dohôd:

| Krajina | D r u h d o h o d y | | | | | |
|-----------|---------------------|-----------|-----------------|-----------|-----------------|-----------|
| | MAD, KD, VTS | | Medziústavná | | Ostatné | |
| | Meno pracovníka | Počet dní | Meno pracovníka | Počet dní | Meno pracovníka | Počet dní |
| Argentína | | | | | Martina Gamba | 10 |

| | | | | | |
|----------------------------|---------------------|-----------|--|--------------------------------|------------|
| Česko | Jiří Hybler | 7 | | Jiří Hybler | 5 |
| | Ondřej Demel | 12 | | Michal Wojak | 5 |
| | | | | Vladana Šamajová | 39 |
| Francúzsko | Prof. Trond Saue | 4 | | | |
| India | | | | Raghvendra Singh Yadav | 61 |
| Nemecko | Yuan Jia | 30 | | Daniela Žitňanská | 54 |
| Poľsko | Malgorzata Zimowska | 10 | | Atrur Wodynski | 62 |
| | | | | Dr. Katarzyna Podolska-Serafin | 14 |
| Rakúsko | | | | Christina Atzenhofer | 24 |
| | | | | Sabine Gschiel | 24 |
| USA | | | | Shelly A. Arreguin | 31 |
| Počet prijatí spolu | 5 | 63 | | 11 | 329 |

(C) Účasť pracovníkov pracoviska na konferenciách v zahraničí (nezahrnutých v "A"):

| Krajina | Názov konferencie | Meno pracovníka | Počet dní |
|----------|----------------------|---------------------|-----------|
| Belgicko | 5th ICSAC | Ondrej Hanzel | 4 |
| | | Jaroslav Sedláček | 4 |
| | ACIN 2013 | Anna Prnová | 7 |
| Brazília | ICC | Juraj Bujdák | 11 |
| | XV ICC | Peter Komadel | 7 |
| | | Jana Madejová | 7 |
| | | Helena Pálková | 7 |
| | | Eva Scholtzová | 7 |
| Česko | "Struktura 2013" | Lubomír Smrček | 2 |
| | "Súťaž mladých 2013" | Ondrej Hanzel | 3 |
| | 12th CESTC | James Richard Asher | 4 |
| | | Marcela Hrdá | 4 |
| | | Vladimír Malkin | 4 |
| | 23 rd ICG | Mária Chromčíková | 7 |
| | 23rd ICG | Katarína Faturíková | 7 |
| | | Dušan Galusek | 6 |
| | | Hana Kaňková | 7 |
| | | Jozef Kraxner | 6 |
| | | Anna Prnová | 6 |
| | | Jana Vokelová | 7 |
| | 23rd IGC | Peter Šimurka | 6 |
| | 4th JCHPSTC | Veronika Gurišová | 4 |
| | | Anna Prnová | 5 |
| | Anamet - TA | Anna Prnová | 2 |
| | CESTC | Stanislav Kedžuch | 4 |
| | | Jozef Noga | 4 |
| | EM - MR | Jozef Kraxner | 2 |
| | JCHPSTC | Milan Drábik | 4 |
| | | Eva Hadzimová | 4 |
| | KS | Mária Chromčíková | 5 |
| | NANO Ostrava 2013 | Valéria Bizovská | 4 |
| | | Peter Boháč | 4 |
| | | Adriana Czimerová | 4 |
| | | Alexander Čeklovský | 4 |
| | | Jana Madejová | 4 |

| | | | |
|----------------|-------------------------------------|---------------------|----|
| | | Samuel Sas | 4 |
| | | Ľudmila Sekeráková | 4 |
| | Seminár | Mária Chromčíková | 2 |
| | Seminár sklárskych pecí | Jozef Kraxner | 2 |
| | Seminár VILA | Mária Chromčíková | 5 |
| | SETARAM | Anna Prnová | 3 |
| Francúzsko | 13th ICECS | Dušan Galusek | 6 |
| | | Monika Hrabalová | 5 |
| | | Ismail Ibrahim | 5 |
| | | Zoltán Lenčేశ | 5 |
| | | Pavol Šajgalík | 7 |
| | 17th ESFC | Miroslav Boča | 5 |
| | | Blanka Kubíková | 5 |
| | | František Šimko | 5 |
| | E - MRS | Zoltán Lenčేశ | 4 |
| Holandsko | IGP | Peter Šimurka | 5 |
| India | 4th ICRACM | Zoltán Lenčేశ | 8 |
| | ICG | Peter Šimurka | 5 |
| Japonsko | 5th JCS-ISTC | Oľga Malkin | 28 |
| | | Vladimír Malkin | 28 |
| Litva | 2nd CEECTAC | Mária Chromčíková | 6 |
| | | Marek Liška | 6 |
| Maďarsko | 9th ECC | Jozef Noga | 6 |
| Nemecko | ICG | Peter Šimurka | 4 |
| Poľsko | IMT | Zoltán Lenčేశ | 3 |
| Rakúsko | "Workshop on Theoretical Chemistry" | Stanislav Kedžuch | 5 |
| | 15 OC | Milan Drábik | 4 |
| | MMQC | James Richard Asher | 6 |
| | | Marcela Hrdá | 6 |
| | | Oľga Malkin | 6 |
| | | Vladimír Malkin | 6 |
| Rusko | 2nd CMLM | Anna Brtánová | 7 |
| | | Adriana Czimerová | 4 |
| | | Peter Komadel | 7 |
| | | Jana Madejová | 6 |
| Srbsko | CYSC | Magdaléna Domanická | 6 |
| | SM - PAC | Roman Bystrický | 6 |
| | | Ondrej Hanzel | 6 |
| | | Michal Vetrecin | 6 |
| Švajčiarsko | 21 - CE | Monika Micháľková | 2 |
| Taiwan | ACTSEA 2013 | Zoltán Lenčేశ | 7 |
| | | Pavol Šajgalík | 7 |
| Taliansko | 12th ICSNCM | Mária Chromčíková | 8 |
| | CERMODEL | Ismail Ibrahim | 5 |
| Turecko | 44 IUPAC | Milan Drábik | 8 |
| | VILA | Peter Šimurka | 4 |
| Ukrajina | N - AP 2013 | Peter Boháč | 12 |
| | | Adriana Czimerová | 12 |
| | | Alexander Čeklovský | 12 |
| USA | 10th PRCCGT | Zoltán Lenčేశ | 6 |
| | | Pavol Šajgalík | 6 |
| | | Peter Šimurka | 9 |
| | 37th ICEACC | Zoltán Lenčేశ | 6 |
| | | Pavol Šajgalík | 6 |
| | 50th AM-CMS | Valéria Bizovská | 8 |
| | 50th AM-CMS | Peter Komadel | 11 |
| | 50th AM-CMS | Jana Madejová | 8 |
| Veľká Británia | AM - SGT 2013 | Mária Chromčíková | 7 |
| | | Marek Liška | 7 |

| | | | |
|--------------|-----------|----------------|------------|
| | ECM28 | Ľubomír Smrčok | 7 |
| Spolu | 52 | 95 | 582 |

Vysvetlivky: MAD - medziodkademické dohody, KD - kultúrne dohody, VTS - vedecko-technická spolupráca v rámci vládnych dohôd

Skratky použité v tabuľke C:

"Struktura 2013" - "Struktura 2013"

"Súťaž mladých 2013" - "Súťaž mladých 2013"

"Workshop on Theoretical Chemistry" - "Workshop on Theoretical Chemistry"

10th PRCCGT - 10th Pacific Rim Conference on Ceramic and Glass Technology

12th CESTC - 12th CESTC CONFERENCE

12th ICSNCM - 12th International Conference on the Structure of Non Crystalline Materials

13th ICECS - 13th International Conference of the European Ceramic Society

15 OC - "15. Österreichische Chemietage"

17th ESFC - 17th European Symposium on Fluorine Chemistry

21 - CE - "21 years of Ceramics at Empa - New Materials for Energy and Environmental Technologies"

23 rd ICG - 23 rd International Congress on Glass

23rd ICG - 23rd International Congress on Glass

23rd ICG - 23 rd International Congress on Glass

23rd ICG - ICG konferencia

23rd IGC - 23. Medzinárodný sklársky kongres

2nd CEECTAC - 2nd Central and Eastern European Conference on Thermal Analysis and Calorimetry

2nd CMLM - 2nd International Conference on Clays, Clay Minerals and Layered Materials

2nd CMLM - 2nd International conference Clays, Clay Minerals and Layered Materials

37th ICEACC - 37th International Conference and Exposition on Advanced Ceramics and Composites

44 IUPAC - "44. kongres IUPAC"

4th ICRACM - 4th International Conference on Recent Advances in Composite materials 2013

4th JCHPSTC - 4th Joint Czech-Hungarian-Polish-Slovak Thermoanalytical Conference

50th AM-CMS - 50 Annual Meeting of CMS

5th ICSAC - 5th International Conference on Shaping of Advanced Ceramics

5th JCS-ISTC - 5th JCS International Symposium on Theoretical Chemistry

9th ECC - 9th European Conference of Computational

ACIN 2013 - ACIN 2013

ACTSEA 2013 - ACTSEA 2013

AM - SGT 2013 - Society of Glass Technology Annual Meeting 2013

Anamet - TA - Anamet - "Termická analýza a reologie v teórii a praxi"

CERMODEL - Medzinárodná konferencia CERMODEL 2013

CESTC - "Central European Symposium on Theoretical Chemistry"

CESTC - Central European Symposium on Theoretical Chemistry

CYSC - Conference for young scientist in ceramics -students meeting

E - MRS - E-MRS Strasbourg Spring Meeting 2013

ECM28 - European Crystallographic Meeting 28

EM - MR - Electron microscopy in Material Research

ICC - International Clay Conference 2013

ICG - "Asia-Pacific Meeting of Glass and Allied Industries"

ICG - Zasadnutie riadiacich štruktúr ICG

IGP - "INNOVATION IN GLASS PRODUCTION"

IMT - International Conference on Innovative Manufacturing Technology 2013

JCHPSTC - 4th Joint Czech-Hungarian-Polish-Slovak Thermoanalytical Conference

JCHPSTC - "4th Joint Czech-Hungarian-Polish-Slovak Thermoanalytical Conference"

KS - Kalorimetrický seminár

MMQC - Workshop on Modern Methods in Quantum Chemistry

N - AP 2013 - "Nanomaterials: Application and Properties 2013"

NANO Ostrava 2013 - NANO Ostrava 2013

Seminár - Seminár

Seminár sklárskych pecí - 12. Medzinárodný seminár- Aplikace modelování při konstrukci optimalizaci a řízení sklárskych pecí.

Seminár VILA - Seminár VILA

SETARAM - SETARAM HEAT CAPACITY: METHODS AND MEASUREMENTS

SM - PAC - Students meetings "Processing and application of ceramics"

VILA - VILA

XV ICC - XV International Clay Conference

XV ICC - XV International Clay Conference

XV ICC - XV International Clay Conference