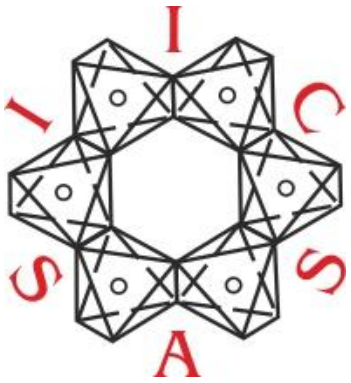
Ústav anorganickej chémie SAV



Správa o činnosti organizácie SAV za rok 2011

Bratislava
január 2012

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1. Základné údaje o organizácii

1.1. Kontaktné údaje

Názov: Ústav anorganickej chémie SAV
Riaditeľ: prof. RNDr. Pavol Šajgalík, DrSc.
Zástupca riaditeľa: doc. Ing. Miroslav Boča, PhD.
Vedecký tajomník: RNDr. Jana Madejová, DrSc.
Predseda vedeckej rady: RNDr. Peter Komadel, DrSc.
Člen snemu SAV: prof. RNDr. Pavol Šajgalík, DrSc.
Adresa: Dúbravská cesta 9, 845 36 Bratislava 45

http://www.uach.sav.sk/

Tel.: 02/59410401
Fax: 02/59410444
E-mail: uachzde@savba.sk, uachsekr@savba.sk
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**
  doc. Ing. Dušan Galusek, PhD.

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	95	45	50	14	23	83	68,87	52,94
Vedeckí pracovníci	58	38	20	12	11	48	38,58	38,58
Odborní pracovníci VŠ	22	5	17	2	11	21	17,34	10,11
Odborní pracovníci ÚS	13	2	11	0	1	12	10,95	4,25
Ostatní pracovníci	2	0	2	0	0	2	2	0

K – kmeňový stav zamestnancov v pracovnom pomere k 31.12.2011 (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 31.12.2011 (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 31.12.2011)

Rodová skladba	Pracovníci s hodnosťou				Vedeckí pracovníci v stupňoch		
	DrSc.	CSc./PhD.	prof.	doc.	I.	IIa.	IIb.
Muži	6	32	3	8	6	9	23
Ženy	2	18	0	0	2	2	16

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	4	6	8	2	2	2	12	1	0
Ženy	7	4	4	3	1	4	2	1	1

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2011

	Kmeňoví zamestnanci	Vedeckí pracovníci	Riešitelia projektov
Muži	44,1	42,8	44,6
Ženy	40,7	36,8	41,6
Spolu	42,3	40,7	43,3

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

Ústav bol aj v roku 2011 riešiteľom desiatich projektov financovaných z prostriedkov ŠF EÚ v objeme takmer 7 mil. € - sú to len prostriedky dedikované ústavu. Celkový objem prostriedkov administrovaných v projektoch ŠF EÚ je v súčasnosti cca 23,1 mil. €, čo predstavuje približne dvadsaťnásobok bežného ročného rozpočtu ústavu a je reálny predpoklad, že sa ešte zvýši. V roku 2011 sa ústav zúčastnil na výzve OP VaV OPVaV-2011/4.2/01-PN 4.2 *Prenos poznatkov a technológií získaných výskumom a vývojom do praxe v Bratislavskom kraji* v rámci projektu Centrum aplikovaného výskumu nových materiálov a transferu technológií, ktorý podáva SAV začiatkom roku 2012. Z toho vyplynula aj naliehavá potreba rozšírenia administratívy ústavu. Zvýšený počet pracovníkov ústavu v poslednom roku je spojený s nárastom počtu administratívnych pracovníkov manažujúcich projekty ŠF. Prepočítaný počet pracovníkov vzrástol z 59,6 FTE v roku 2008 na 68,87 FTE v roku 2011. Tento nárast počtu pracovníkov ústavu je hradený z prostriedkov projektov ŠF, avšak pri problematickom prísune prostriedkov z Agentúry Ministerstva školstva, vedy, výskumu a športu SR pre ŠF EÚ (ASFEU) častokrát vznikajú veľmi napäté situácie v mzdovom fonde ústavu.
Priemerný vek zamestnancov ÚACh SAV sa dlhodobo nemení a je pod hranicou 45 rokov. V roku 2011 je **priemerný vek všetkých pracovníkov ústavu 42,3 roku a priemerný vek vedeckých pracovníkov je 40,7.** Oproti roku 2010 ústav zaznamenal mierny pokles priemerného veku v oboch

kategóriách pracovníkov. Udržanie tohto trendu 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, Ib 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 už aj v obmedzenej forme realizuje.

2. Vedecká činnosť

2.1. Domáce projekty

Tabuľka 2a Zoznam domácich projektov riešených v roku 2011

ŠTRUKTÚRA PROJEKTOV	Počet projektov		Čerpané financie za rok 2011 (v €)		
			A		B
	A	B	spolu	pre organizáciu	
1. Vedecké projekty, ktoré boli r. 2011 financované VEGA	10	2	97351	97351	14880
2. Projekty, ktoré boli r. 2011 financované APVV	13	2	356780	312746	30041
3. Projekty OP ŠF	3	6	3110899	1983127	99373
4. Projekty centier excelentnosti SAV	0	1	-	-	2200
5. Iné projekty (FM EHP, ŠPVV, Vedecko-technické projekty, ESF, na objednávku rezortov a pod.)	1	0	838	838	-

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

Tabuľka 2b Zoznam domácich projektov podaných v roku 2011

Štruktúra projektov	Miesto podania	Organizácia je nositeľom projektu	Organizácia sa zmluvne podieľa na riešení projektu
1. Účasť na nových výzvach APVV r. 2011	-	6	6
2. Projekty výziev OP ŠF	Bratislava		1
podané r. 2011	Regióny		
3. Projekty výziev FM EHP podané r. 2011	-		

Názov projektu: Aplikovaný výskum a vývoj progresívnych diamantových nástrojov na báze sklo-keramických prekurzorov
Kód projektu: APVV-0890-11
Podávateľ projektu: Ing. Martin Mach, DEEM s.r.o. Liptovský Hrádok (podnikateľský sektor)
Koordinátor ÚACH: doc. Ing. Zoltán Lenčéš, PhD.
Stav: podaný

Názov projektu: Fotoaktívne nanomateriály s luminiscenčnými a antimikrobiálnymi vlastnosťami
Kód projektu: APVV-0291-11
Podávateľ projektu: RNDr. Juraj Bujdák, DrSc., ÚACH SAV
Stav: podaný
Názov projektu: Imobilizácia biologicky aktívnych látok v nanomateriáloch
Kód projektu: SK-GR-0048-11

Podávateľ projektu: Mgr. Ľuboš Jankovič, PhD., ÚACH SAV
Zahraničný partner: Dr. Nikolaos Kourkoumelis, Department of Medical Physics, University of Ioannina, Grécko
Stav: podaný

Názov projektu: Mechanizmy korózie a mikromechanické vlastnosti dentálnych materiálov
Kód projektu: APVV-0218-11
Podávateľ projektu: doc. Ing. Dušan Galusek, PhD., ÚACH SAV
Stav: podaný

Názov projektu: Nové sklené a sklokeramické fosfory na báze hlinitanov vzácnych zemín pre aplikácie v LED diódach vyžarujúcich biele svetlo
Kód projektu: APVV-0761-11
Podávateľ projektu: Ing. Róbert Klement, PhD., TnU AD
Stav: podaný

Názov projektu: Kvantovo-chemické výpočty magnetických vlastností rôznych chemických zlúčenín so zahrnutím relativistických efektov
Kód projektu: SK-FR-0018-11
Podávateľ projektu: Dr. Vladimír Malkin, DrSc., ÚACH SAV
Zahraničný partner: Dr. Helene Bolvin, PhD., Francúzsko
Stav: schválený

Názov projektu: Nové sorbenty na báze organomodifikovaných vrstevnatých materiálov pre environmentálne aplikácie
Kód projektu: SK-FR-0031-11
Podávateľ projektu: Mgr. Ľuboš Jankovič, PhD., ÚACH SAV
Zahraničný partner: Dr. Régis Guégan, Institut des Sciences de la Terre d`Orléans, Université d`Orléans, Francúzsko
Stav: zamietnutý

Názov projektu: Optimalizácia mechanických a elektrických vlastností vodivej keramiky pre aplikácie v energetike
Kód projektu: APVV-0126-11
Podávateľ projektu: RNDr. Pavol Hvizdoš CSc., ÚMV SAV, Košice
Koordinátor ÚACH: doc. Ing. Miroslav Hnatko, PhD.
Stav: podaný

Názov projektu: Polyaplikovateľné heterocykly – návrh štruktúry, syntéza a vlastnosti
Kód projektu: APVV-0038-11
Podávateľ projektu: prof. Ing. Viktor Milata, DrSc., FCHPT STU, Bratislava
Koordinátor ÚACH: RNDr. Ľubomír Smrčok, CSc.
Stav: podaný

Názov projektu: Štruktúra a vlastnosti oxidových skiel určených na aplikáciu v jadrovej energetike (Structure and properties of oxide glasses for application in nuclear power technology)
Kód projektu: napr.APVV-0487-11
Podávateľ projektu: Ing. Mária Chromčíková, PhD., VILA, ÚACH SAV
Stav: podaný

Názov projektu: Vývoj nitridu kremičitého s prídavkom multivrstiev grafénu
Kód projektu: APVV-0161-11

Podávateľ projektu: Mgr. Monika Kašiarová, PhD., ÚMV SAV, Košice
Koordinátor ÚACH: prof. RNDr. Pavol Šajgalík, DrSc.
Stav: podaný

Názov projektu: Zvýšenie efektívnosti využívania vybraných nerudných surovín Slovenska
Kód projektu: APVV-0159-11
Podávateľ projektu: doc. Mgr. Peter Uhlík, PhD., PríFUK, Bratislava
Koordinátor ÚACH: RNDr. Jana Madejová, DrSc.
Stav: podaný

Názov projektu: Aplikovaný výskum procesov a technológie generátora tepelnej plazmy pre plazmotermické rozrušovania hornín
Kód projektu: NFP 26240220185
Podávateľ projektu: Geothermal Anywhere, s.r.o.
Koordinátor ÚACH: doc. Ing. Miroslav Boča, PhD.
Stav: podaný

2.2. Medzinárodné projekty

2.2.1. Medzinárodné projekty riešené v roku 2011

Tabuľka 2c Zoznam medzinárodných projektov riešených v roku 2011

ŠTRUKTÚRA PROJEKTOV	Počet projektov		Čerpané financie za rok 2011 (v €)		
			A		B
	A	B	spolu	pre organi-záciu	
1. Projekty 6. a 7. rámcového programu EÚ	0	1	-	-	14816
2. Multilaterálne projekty v rámci vedeckých programov **COST, ERANET, INTAS, EUREKA, PHARE, NATO, UNESCO, CERN, IAEA, ESF (European Science Foundation), ERDF, ESA a iné**	0	0	-	-	-
3. Projekty v rámci medzivládnych dohôd o vedecko-technickej spolupráci	0	0	-	-	-
4. Bilaterálne projekty	9	0	3500	3500	-
5. Podpora medzinárodnej spolupráce z národných zdrojov (MVTS, APVV, ...)	3	1	42286	42286	10902
6. Iné projekty financované alebo spolufinancované zo zahraničných zdrojov	0	0	-	-	-

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

2.2.2. Medzinárodné projekty v 7. RP EÚ podané v roku 2011

Tabuľka 2d Podané projekty 7. RP EÚ v roku 2011

Počet podaných projektov v 7. RP EÚ	A	B
	0	2

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

Názov projektu: Pushing the Envelope of Nuclear Magnetic Resonance Spectroscopy for Paramagnetic Systems. A Combined Experimental and Theoretical Approach
Podávateľ projektu: Dr. Guido Pintacuda, Centre Européen de RMN à Très Hauts Champs, CNRS (CNRS, Lyon), France.
V rámci výzvy: FP7-PEOPLE-2011-ITN 5
Partneri projektu: Nemecko (Technische Universität Berlin, Institut für Chemie; Karlsruhe, Bruker BioSpin,); Fínsko (University of Oulu, Department of Physics), Veľká Británia (University of Cambridge, Department of Chemistry), Slovensko (Ústav anorganickej chémie), Taliansko (University of Florence, CERM Magnetic Resonance Center; ProtEra,), Švédsko (Stockholm University, Department of Materials and Environmental Chemistry), Holandsko (Leiden University, Institute of Chemistry, section Protein Chemistry; ZoBio BV)
Kordinátor ÚACH: Dr. Vladimír Malkin
Stav: zamietnutý

Názov projektu: Thermal rock transformations for efficient rock disintegration
Podávateľ projektu: Dr. Ivan Kočiš, Geothermal Anywhere s.r.o.
V rámci výzvy: FP7-NMP-2012-SME-6
Partneri projektu: Veľká Británia (EGS Energy Ltd.), Rakúsko (Zoerkler GmbH.), Nemecko (Herrenknecht AG, Karlsruhe Institute of Technology, Universität Würzburg), Taliansko (University of Bari), Slovensko (Ústav anorganickej chémie SAV, Monoram Technologies s.r.o.)
Kordinátor ÚACH: doc. Ing. Miroslav Boča, PhD.
Stav: podaný
Údaje k domácim a medzinárodným projektom sú uvedené v prílohe B.

2.2.3. Zámery na čerpanie štrukturálnych fondov EÚ v ďalších výzvach

Ústav sa v roku 2011 zapojil do dvoch výziev ŠF v operačnom programe Veda a výskum. Boli podané tri projekty:

Názov projektu: Aplikovaný výskum procesov a technológie generátora tepelnej plazmy pre plazmotermické rozrušovania hornín
Kód projektu: NFP 26240220185
Podávateľ projektu: Geothermal Anywhere, s.r.o.

Názov projektu: Centrum aplikovaného výskumu nových materiálov a transferu technológií
Kód projektu: Výzva: OP VaV OPVaV-2011/4.2/01-PN 4.2 Prenos poznatkov a technológií získaných výskumom a vývojom do praxe v Bratislavskom kraji
Podávateľ projektu: SAV

Názov projektu: Vedecký park STU
Kód projektu: Výzva: OP VaV OPVaV-2011/4.2/01-PN 4.2 Prenos poznatkov a technológií získaných výskumom a vývojom do praxe v Bratislavskom kraji

Podávateľ projektu: STU

2.3. Najvýznamnejšie výsledky vedeckej práce

2.3.1. Základný výskum

Názov: Nové efektívne metódy na predikciu a interpretáciu NMR a EPR spektier látok obsahujúcich ťažké kovy
Autorský kolektív zo SAV: V. Malkin, O. Malkin, P. Hrobárik M. Repiský, S. Komorovský, A. Křístková

Vyvinuli sa nové, plne relativistické kvantovo-chemické metódy založené na riešení Diracovej rovnice pre predikciu a interpretáciu NMR a EPR spektier látok, ktoré obsahujú ťažké prvky. Použitie týchto metód zvyšuje presnosť výpočtov NMR a EPR parametrov zlúčenín prechodných kovov - lantanoidov a aktinoidov. V súčasnosti je plne relativistický kvantovo-chemický balík ReSpect najúčinnejším programom na svete pre výpočty magnetických vlastností zlúčenín ťažkých prvkov. Dovoľuje aplikovať najmodernejšie relativistické kvantovo-chemické prístupy i pri výskume látok obsahujúcich ťažké prvky v oblasti jadrovej energetiky, čo doteraz nebolo možné. Metódy sa už použili pre štúdium systémov, ktoré majú kľúčovú úlohu v katalýze.

Výstupy:

1. E. Malkin, M. Repiský, S. Komorovský, P. Mach, O.L. Malkina, V.G. Malkin: Effects of finite size nuclei in relativistic four-component calculations of hyperfine structure, *J. Chem. Phys.* **13**4 (2011) 044111.
2. P. Hrobárik, V. Hrobáriková, F. Meier, M. Repiský, S. Komorovský, M. Kaupp: Relativistic Four-Component DFT Calculations of 1H NMR Chemical Shifts in Transition-Metal Hydride Complexes: Unusual High-Field Shifts Beyond the BuckinghamStephens Model, *J. Phys. Chem. A* **115** (2011) 5654.
3. P. Hrobárik, M. Repiský, S. Komorovský, V. Hrobáriková, M. Kaupp, "Assessment of higher-order spin–orbit effects on electronic g-tensors of d1 transition-metal complexes by relativistic two- and four-component methods", Theor Chem Acc 129 (2011) 715–725.

2.3.2. Aplikačný typ

Názov: Mechanizmy korózie inžinierskej keramiky v podmienkach subkritických vodných roztokov
Autorský kolektív zo SAV: D. Galusková, P. Šajgalík, D. Galusek, M. Hnatko

V rámci projektu APVV-0171-06 kolektív zložený z riešiteľov Centra kompetencie skla a Oddelenia keramiky ÚACH SAV navrhol a overil mechanizmy korózie pokročilej oxidovej (Al_2O_3) a neoxidovej (Si_3N_4, SiAlON) keramiky v podmienkach subkritických vodných roztokov pri teplotách do 290 °C a stanovil rýchlosti korózie týchto materiálov. Pri oxidovej keramike dochádza za týchto podmienok k prednostnému ataku korózneho média na sklenú fázu na hraniciach zŕn, pričom nastáva jej korózia. Korundová matrica je korózne vysoko odolná a za daných podmienok do reakcie s okolitým prostredím nevstupuje. Naproti tomu u neoxidovej keramiky je ytrito-kremičitanová fáza na hraniciach zŕn vysoko odolná. Ku koróznemu poškodeniu dochádza najmä v dôsledku prednostného ataku korózneho média a kongruentného rozpúšťania neoxidovej keramickej matrice sprevádzaného tvorbou pasivujúcej vrstvy SiO_2. Získané výsledky sú aplikovateľné pri vývoji a optimalizácii keramických materiálov pre hydrotermálne zdroje energie, pri likvidácii nebezpečného chemického odpadu oxidáciou v sub- alebo super-kritickej vode ako aj

v desalinačných jednotkách na získavanie pitnej vody.

Výstupy:

1. D. Galusková, M. Hnatko, D. Galusek, P. Šajgalík, Corrosion of Structural Ceramics Under Sub-Critical Conditions in Aqueous Sodium Chloride Solution and in Deionized Water. Part I: Dissolution of Si_3N_4-Based Ceramics, *J. Am. Ceram. Soc.* **94** 3035–3043 (2011)
2. D. Galusková, M. Hnatko, D. Galusek, P. Šajgalík, Corrosion of Structural Ceramics Under Sub-Critical Conditions in Aqueous Sodium Chloride Solution and in Deionized Water. Part II: Dissolution of Al_2O_3-Based Ceramics, *J. Am. Ceram. Soc.* **94** 3044–3052 (2011)
3. P. Šajgalík, D. Galusková, M. Hnatko, D. Galusek, Interactions of Si_3N_4-based ceramics in water environment under subcritical conditions, Proc. of the 35th International Conference on Advanced Ceramics and Composites, 23. - 28. 01. 2011, Daytona Beach, USA, Ed. by S. Widjaja and D. Singh, American Ceramic Society, 2011, on CD-ROM.

2.3.3. Medzinárodné vedecké projekty

Názov: Príprava keramických kompozitov z polymérnych prekurzorov
Autorský kolektív zo SAV: Z. Lenčéš, P. Šajgalík, T. Plachký, D. Galusek, D. Galusková

V spolupráci s Technickou univerzitou Darmstadt v Nemecku (prof. Ralf Riedel) sa pripravili hutné keramické kompozity na báze Si_3N_4 a SiC s použitím nekonvenčných spekacích prísad SiOC, SiAlOC a SiHfOC. Prísady spekania sa pripravili zosieťovaním a pyrolýzou vhodných organometalických prekurzorov. Výhodou tohto postupu je možnosť dizajnu zloženia fáz na hraniciach zŕn keramických kompozitov už pri príprave polymérneho prekurzoru, teda na atomárnej úrovni. Tento netradičný a úplne nový prístup k syntéze prísad spekania umožnil prípravu hutných keramických kompozitov pri nižších teplotách spekania, zvýšenie ich koróznej odolnosti pridaním Hf do systému a popritom zachovanie mechanických vlastností pôvodnej keramickej matrice. Modifikáciou prídavkov spekania pripravených z organometalických prekurzorov je možná zmena konštrukčných keramických kompozitov na funkčné alebo hybridné. Napríklad dopovaním SiAlOC s európiom sa podarilo pripraviť luminiscenčný materiál, ktorý pri excitácii UV žiarením emituje intenzívne zelené svetlo.

Projekt 1: Projekt 6.RP EÚ: Contract No. MRTN-CT-2005-019601: *Tailored Multifunctional Polymer Derived Nanoceramics*, PolyCerNet (2006-2010)
Projekt 2: DAAD projekt, project number 50725208: *Hafnia- and Hafnium Nitride-Based Ceramic Nanocomposites with Improved High-Temperature Oxidation and Corrosion Resistance*

Výstupy:

1. T. Plachký, Z. Lenčéš, Ľ. Hric, P. Šajgalík, P. Baláž, R. Riedel, H.J. Kleebe: Processing and mechanical properties of Si_3N_4 composites employing polymer-derived SiAlOC as sintering aid. *J. Eur. Ceram. Soc.*, **30** (2010) 759-767.
2. Papendorf, C. Linck, E. Ionescu, D. Galusková, P. Šajgalík, R. Riedel: Corrosion behaviour of silicon oxycarbide-based ceramic nanocomposites under hydrothermal conditions. *International Journal of Materials Research* **103** (2012) 31-39.
3. T. Plachký, Z. Lenčéš, R. Riedel, P. Šajgalík: Photoluminescent properties of Eu-doped polymer derived SiAlON ceramics. In *Preparation of Ceramic Materials*: 9th International Conference. Herľany, 14.-16. 06. 2011, p. 160-161.

V rámci projektu sa v roku 2011 zorganizovali dve sekcie na významných medzinárodných

podujatiach, ktoré sa venovali keramickým materiálom odvodeným z polymérnych prekurzorov:
Konferencia: 7th International Conference on High-performance Ceramics (CICC-7), 03. - 07. 11. 2011, Xiamen, Čína – 750 účastníkov
Sekcia: Structural and Functional Nitrides
Organizátori: S. Bernard (Institut Européen des Membranes de Montpellier), E. Ionescu (Technische Universität Darmstadt), Z. Lenčéš (UACH SAV, Bratislava) – členovia riešiteľského kolektívu projektu PolyCerNet

Konferencia: Engineering Ceramics 2011, 08. -12. 05. 2011, Kongresové centrum Smolenice, Slovensko – 90 účastníkov
Sekcia: Polymer derived ceramics
Organizátori: P. Šajgalík, Z. Lenčéš, R. Riedel (Technische Universität Darmstadt) M. J. Hoffmann (Karlsruhe Institute of Technology) – členovia riešiteľského kolektívu projektu PolyCerNet a projektu DAAD

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

Tabuľka 2e Štatistika vybraných kategórií publikácií

PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ	A Počet v r. 2011/ doplnky z r. 2010	B Počet v r. 2011/ doplnky z r. 2010	C Počet v r. 2011/ doplnky z r. 2010
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)	**1 / 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)	**54 / 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)	**15 / 0**	**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)	**20 / 0**	**0 / 0**	**0 / 0**
b/ nerecenzovaných (AEE, AEF, AFC, AFD, AFDA, AFDB, BEE, BEF)	**16 / 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**

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...“)

Tabuľka 2f Ohlasy

OHLASY	A Počet v r. 2010/ doplnky z r. 2009	B Počet v r. 2010/ doplnky z r. 2009
Citácie vo WOS (1.1, 2.1)	1160 / 5	0 / 0
Citácie v SCOPUS (1.2, 2.2)	58 / 1	0 / 0
Citácie v iných citačných indexoch a databázach (9, 10)	0 / 0	0 / 0
Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4)	4 / 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
B - pracovisko SAV je uvedené ako materské pracovisko autora odlišné od pracoviska, na ktorom práca vznikla (napr. „on leave...“, „permanent address...“, „present address...“)

2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2g Vedecké podujatia

Prednášky a vývesky na medzinárodných vedeckých podujatiach	68
Prednášky a vývesky na domácich vedeckých podujatiach	15

2.6. Vyžiadané prednášky

2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

Demel O., Kedžuch S., Noga J., Pittner J.: Multireference F12 Coupled Cluster Theory, *7th Congress of the International Society for Theoretical Chemical Physics*, Waseda University (Tokyo), Japonsko, 2. 9. - 9. 9. 2011

Galusek D., Klement R., Prnová A.: Aluminate Glass Phosphors for Energy Saving Lighting Applications, *3rd International Symposium on Advanced Ceramics and Technology for Sustainable Energy Applications*, Kenting, Taiwan, 30. 10. – 2. 11. 2011

Komadel P., Pentrák M., Madejová J., Hronský V., Uhlík P.: Chemical modifications of dioctahedral smectites, *European Clay Conference Euroclay 2011*, Antalya, Turecko, 26. 6. – 1. 7. 2011

Komadel P., Pentrák M., Madejová J.: Čo vplýva na rozpúšťanie ílov v kyselinách, možnosti porovnávania laboratórnych experimentov, *19. Jílová komference v České republice*, Bystřice nad Pernštejnem, ČR, 28. 8. – 31. 8. 2011

Lenčéš Z., Benco L., Šajgalík P., Zhou Y., Jáne E., Velič D.: Europium doped $LaSi_3N_5$: synthesis, spectroscopy and band gaps, *9th International Meeting of Pacific Rim Ceramic Societies (PacRim 9)*, Cairns, Austrália, 10. - 15.7. 2011

Lenčéš Z., Benco L., Šajgalík P., Zhou Y., Jáne E., Velič D.: Eu-doped $MgSiN_2$ and $LaSi_3N_5$-based phosphors - experimental and DFT studies, *3rd International Symposium on Advanced Ceramics and Technology for Sustainable Energy Application (ACTSEA-2011)*, Howard Beach Resort Kenting, Hengchun Town, Taiwan, 30. 10. – 2. 11. 2011

Malkin V.: Fully relativistic calculations of NMR and EPR parameters, *Japan-Czech-Slovak (JCS) Symposium for Theoretical and Computational Chemistry*, Liblice, Czech republic, 18. 05. 2011 – 20. 05. 2011

Malkin O.: Interpretation of spin-spin coupling: novel approaches, *2nd Regional EAST NMR meeting*, Bratislava, 8. - 9. 9. 2011

Noga J., Šimunek J.: Orbital optimized MBPT(2) via non-unitary transformation, *4th JCS Symposium on Theoretical Chemistry*, Liblice, Česká republika, 18. - 20. 5. 2011

Noga J., Šimunek J.: Alternative orbital optimization scheme based on non-unitary transformation, *9th Triennial Congress of the World Association of Theoretical and Computational Chemists*, WATOC 2011, Santiago de Compostela, Španielsko, 16. 7. – 23. 7. 2011

Noga J., Šimunek J.: Alternative orbital optimization scheme based on non-unitary transformation, *Fukui International Symposium on Theoretical Chemistry FISTC*, Kyoto, Japonsko 31. 8.- 1. 9. 2011

Smrčok Ľ.: Powder diffraction and Computational Methods. *NATO Advanced Study Institute*, Erice, Italy, 2. - 12. 6 2011

Šajgalík P., Galusková D., Hnatko M., Galusek D.: Corrosion of silicon nitride ceramics under sub-critical conditions in aqueous sodium chloride solution**,** *35th International Conference and Exposition on Advanced Ceramics and Composites (ICACC),*Daytona Beach, 23. - 28. 1. 2011, FL, USA.

Šajgalík P., Galusková D., Hnatko M., Lenčéš, Z, Kašiarová M,: Corrosion of silicon nitride based ceramics in different molten systems., *9th International Meeting of Pacific Rim Ceramic Societies (PacRim 9)*, Cairns, Austrália, 10. - 15. 7. 2011

Šajgalík P., D., Lojanová Š., Hnatko M., Lenčéš Z. Tatarko P., Dusza J., Chlup Z.: Rare-earth oxides doped Si_3N_4 and Si_3N_4/SiC ceramics., *9th International Meeting of Pacific Rim Ceramic Societies (PacRim 9)*, Cairns, Austrália, 10. - 15.7. 2011

Šajgalík P., Lenčéš Z., Plachký T., Riedel R.: Low temperature densification of non-oxide ceramic composites by using polymer derived Si(Al, Lu)OC as a sintering aid, *7th International Conference on High-Performance Ceramics*, Xiamen, China, 4. - 7. 2011

Šajgalík P.: SiC/Si_3N_4 nano/micro-composites – phase and chemical composition - their implications to the RT and HT mechanical properties (plenary lecture), *7th International Conference on High-Performance Ceramics*, Xiamen, China, 4. – 7. 2011

Šajgalík P., Lenčéš Z., Plachký T., Velič D., Zhou Y., Hirao K.: Silicon Nitride/Oxynitride-Based Phosphors – Synthesis and Characterization, ***3rd*** *International Symposium on Advanced Ceramics and Technology for Sustainable Energy Applications*, Kenting, Taiwan, 30. 10. – 2. 11. 2011.

2.6.2. Vyžiadané prednášky na domácich vedeckých podujatiach

2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

Korenko M.: IIC SAS, its scope and possible overlap to IMR CAC,
- *Institute of Metal Research, Chinese Academy of Sciences*, Shenyang, China, 10.10. 2011
- *Northeastern University in Shenyang*, China, 13.10. 2011

Korenko M., Kucharík M., Vincenc Oboňa J., Janičkovič D., Cordoba R., de Tereza J.M., Klementová M.: Quadrate nanotubes made from deeply undercooled cryolite-alumina melts, *Institute of Metal Research CAS*, Shenyang, Čína, 15. 10. 2011

Komadel P.: Chemical modifications of smectites seen by selected spectroscopic techniques, *Institut für Bodenforschung, Department für Wald- und Bodenwissenschaften*, Viedeň, Rakúsko, 29. 11. 2011

Kraxner J., Galusek D., Chovanec J., Galusková D., Šimurka P., Klement R., Prnová A., Šajgalík P.: Research and project activities in the Joint Laboratory of Glass Research, Vitrum Laugaricio-VILA, *Department of Inorganic and Physical Chemistry, University of Ghent*, Belgicko, 22.2. 2011.

Madejová J., Pálková H., Righi D.: Clay reactivity: acid treatment of reduced-charge montmorillonites. *University of Poitiers*, Francúzsko, 18. 10. 2011

Malkin V.: Fully relativistic calculations of NMR and EPR parameters, *Boreskov Institute of Catalysis*, Novosibirsk, Rusko, 6. 9. 2011

Malkin O.: Recent progress in interpretation of NMR and EPR parameters, *Boreskov Institute of Catalysis*, Novosibirsk, Rusko, 6. 09. 2011

Malkin V.: Fully relativistic calculations of NMR and EPR parameters, *Institute of Solid State Chemistry of the Ural Branch of the Russian Academy of Sciences* (ISSC UB RAS), Ekaterinburg, Rusko, 13.09.2011

Noga J., Šimunek J.: Alternative exact and robust orbital optimization scheme in quantum chemistry suitable for linear scaling algorithms, *Graduate School of System Informatics*, Kobe University, Japonsko, 30. 8. 2011

Prnová A., Piatriková A., Domanická A., Migát M., Hruška B., Kraxner J., Galusek D., Šajgalík P.: Preparation of the ceramics and glassceramics materials in the systems Re_2O_3 –Al_2O_3, *Department*

of Inorganic and Physical Chemistry, University of Ghent, Belgicko, 22.2. 2011

Smrčok Ľ.:Can energy minimization in the solid state substitute Rietveld refinement? *European Synchrotron Radiation Facility*, Grenoble, Francúzsko, 1. 2. 2011

Šajgalík P.: Silicon Nitride/Oxynitride-Based Phosphors – Synthesis and Characterization, *Fachbereich Anorganische Chemie und Materialwissenschaft*, Fachhochschule Münster, Germany, 8. 12. 2011
Ak boli príspevky publikované, sú súčasťou prílohy C, kategória (AFC, AFD, AFE, AFF, AFG, AFH)

2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2011

2.7.1. Vynálezy, na ktoré bol udelený patent

2.7.2. Prihlásené vynálezy

Na Slovensku - počet patentov: 1

Číslo PV: PCT/SK2011/000024
Mená autorov: Šajgalík Pavol, Hnatko Miroslav, Pánek Zdeno
Názov vynálezu: Laboratórny žiarový lis
Majiteľ / spolumajiteľ: ÚACH SAV

2.7.3. Predané licencie

2.7.4. Realizované patenty

Finančný prínos pre organizáciu SAV v roku 2011 a súčet za predošlé roky sa neuvádzajú, ak je zverejnenie v rozpore so zmluvou súvisiacou s realizáciou patentu.

2.8. Iné informácie k vedeckej činnosti

Počet karentovaných publikácií v tomto roku dosiahol číslo 54, čo pri počte 38,58 vedeckých pracovníkov (prepočítaný stav, podľa Tabuľky 1a) znamená 1,4 karentovanej publikácie na vedeckého pracovníka. Aj keď tento parameter oproti vlaňajšku mierne stúpol (vlani 1,2), 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 2,14. *Citovanosť (vo všetkých dostupných databázach WOK – 1165, SCOPUS – 59) na vedeckého pracovníka (prepočítaný stav) je 32,5 citácie. Potešiteľný je trvalý trend rastu počtu citácií a ich prepočtu na vedeckého pracovníka a ich získavanie pracovníkmi všetkých oddelení ústavu.*

Relatívne vysoké renomé pracovníkov ústavu vo svetovej vedeckej komunite dokumentuje aj vysoký počet vyžiadaných prednášok pracovníkov ústavu na medzinárodných vedeckých podujatiach, ktorých bolo v roku 2011 18, viaceré z nich odzneli na veľmi významných svetových konferenciách. Pracovníci ústavu predniesli 12 prednášok na zahraničných pracoviskách.

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 2011

Forma	Počet k 31.12.2011				Počet ukončených doktorantúr v r. 2011					
	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	5	3	1	1	1	1	1	0	0	0
Interná z iných zdrojov	1	1	0	0	0	0	0	0	0	0
Externá	0	1	0	0	0	0	0	0	0	0
Spolu	**6**	**5**	**1**	**1**	**1**	**1**	**1**	**0**	**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	0	0	0	0	0	0

3.3. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou

Tabuľka 3c Menný zoznam ukončených doktorandov v roku 2011 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 hodnosť
Františka Frajkorová	interné štúdium hradené z prostriedkov SAV	10 / 2007	9 / 2011	5.2.19 anorganická technológia a materiály	doc. Ing. Miroslav Hnatko PhD., Ústav anorganickej chémie SAV	Fakulta chemickej a potravinárskej technológie STU

Jozef Chovanec	interné štúdium hradené z prostriedkov SAV	10 / 2007	9 / 2011	5.2.19 anorganická technológia a materiály	doc. Ing. Dušan Galusek PhD., 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 odborov s uvedením VŠ

Tabuľka 3d Zoznam akreditovaných študijných odborov s uvedením univerzity/vysokej školy a fakulty, kde sa doktorandský študijný program uskutočňuje

Názov študijného odboru (ŠO)	**Číslo ŠO**	**Doktorandské štúdium uskutočňované na:** (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 spoločných odborových komisií pre doktorandské štúdium	**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 technológia a materiály)	prof. Ing. Marek Liška, DrSc. (Fakulta chemické technologie VŠCHT, Praha, ČR)	RNDr. Juraj Bujdák, DrSc. (I)
doc. Ing. Miroslav Boča, PhD. (anorganická chémia)	prof. Ing. Marek Liška, DrSc. (Trenčianska univerzita Alexandra Dubčeka v Trenčíne)	Mgr. Adriana Czímerová, PhD. (IIa)
RNDr. Juraj Bujdák, DrSc. (anorganická chémia)	prof. Ing. Marek Liška, DrSc. (Fakulta priemyselných technológií TnUAD v Púchove)	RNDr. Juraj Bujdák, DrSc. (DrSc., Slovenská Akadémia Vied)
doc. RNDr. Milan Drábik, CSc. (anorganická chémia)	prof. RNDr. Jozef Noga, DrSc. (Prírodovedecká fakulta UK)	
doc. Ing. Dušan Galusek, PhD. (anorganická technológia a materiály)	prof. RNDr. Pavol Šajgalík, DrSc. (Hutnícka fakulta TUKE)	
doc. Ing. Miroslav Hnatko, PhD. (anorganická technológia a materiály)	prof. RNDr. Pavol Šajgalík, DrSc. (Trenčianska univerzita Alexandra Dubčeka v Trenčíne)	
RNDr. Peter Komadel, DrSc. (anorganická chémia)	prof. RNDr. Pavol Šajgalík, DrSc. (Vysoké učení technické, Brno)	
doc. Ing. Zoltán Lenčéš, PhD. (odbor v zahraničí)	prof. RNDr. Pavol Šajgalík, DrSc. (Fakulta metalurgie a materiálového inženírství, Vysoká škola báňská TU)	

doc. Ing. Zoltán Lenčéš, PhD. (anorganická technológia a materiály)	prof. RNDr. Pavol Šajgalík, DrSc. (Slovenská technická univerzita v Bratislave)	
prof. Ing. Marek Liška, DrSc. (anorganická technológia a materiály)		
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. (fyzika plazmy)		
prof. RNDr. Jozef Noga, DrSc. (anorganická chémia)		
prof. RNDr. Pavol Šajgalík, DrSc. (anorganická technológia a materiály)		

3.5. Údaje o pedagogickej činnosti

Tabuľka 3f Prednášky a cvičenia vedené v roku 2011

PEDAGOGICKÁ ČINNOSŤ	Prednášky		Cvičenia a semináre	
	doma	v zahraničí	doma	v zahraničí
Počet prednášateľov alebo vedúcich cvičení	4	0	11	0
Celkový počet hodín v r. 2011	92	0	611	0

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**	10
3.	**Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)**	9
4.	**Počet školených doktorandov (aj pre iné inštitúcie)**	21
5.	**Počet oponovaných dizertačných a habilitačných prác**	12
6.	**Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce**	9

7.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác**	4
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**	1

3.6. Iné dôležité informácie k pedagogickej činnosti

Na ÚACH SAV bolo na akademický rok 2011/2012 vypísaných celkovo 14 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 tento akademický rok boli prijatí dvaja noví študenti (Mgr. Magdaléna Domanická na študijný odbor 5.2.19, Ing. Samuel Sas na študijný odbor 4.1.15).

V rámci doktorandského štúdia a v rámci spolupráce medzi ÚACH a Fakultou metalurgie a materiálového inženýrství v Ostrave pracujú na ústave ďalší dvaja doktorandi (školiteľom špecialistom je doc. Zoltán Lenčéš, PhD. a doc. Miroslav Hnatko, PhD.). Opäť sa tým prehĺbila vzájomná spolupráca medzi obidvomi inštitúciami, čoho dôsledkom by v budúcnosti mohol byť vyšší záujem o PhD štúdium na našom pracovisku zo strany študentov VŠB TU Ostrava.
Od novembra 2011 začala doktorandské štúdium ďalšia doktorandka z ČR, ktorá bola prijatá na tému „Príprava luminiscenčných materiálov z ternárnych nitridov“ v rámci projektu 7. RP EÚ FUNEA, jej školiteľom je doc. Ing. Zoltán Lenčéš, PhD. V rámci tohto projektu je pripravené ešte jedno štipendium pre ďalšieho zahraničného doktoranda.

Vedenie ústavu spolu so školiteľmi ÚACH SAV kladú veľký dôraz na kvalitnú prípravu PhD študentov, ktorej súčasťou je aj účasť na študentských vedeckých podujatiach a konferenciách. Už pravidelne sa doktorandi zúčastňujú Študentskej Vedeckej Konferencie (ŠVK 2011 Bratislava) organizovanej Prírodovedeckou fakultou UK, ako aj zahraničného stretnutia mladých vedeckých pracovníkov a doktorandov v Srbsku (Department of Materials Engineering Faculty of Technology University of Novi Sad).

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 2011 sa praxe zúčastnili traja študenti 4. ročníka. Jeden zo študentov (Petra Poláková) sa na základe dobrých skúseností, rozhodol využiť možnosť vypracovať si na ÚACH diplomovú prácu na tému „Príprava pórovitého Si_3N_4 pre bioaplikácie metódou RBSN“. Toto by mohlo napomôcť k získaniu kvalitných a zároveň v danej téme pripravených PhD študentov.

Dňa 4. októbra 2011 sa na ÚACH SAV konala **SÚŤAŽ MLADÝCH VEDECKÝCH PRACOVNÍKOV.** Súťaže sa zúčastnilo 14 mladých pracovníkov do 35 rokov z troch rôznych inštitúcií (ÚACH SAV, TnU AD Trenčín, FCHPT STU, Karlova Univerzita Praha, ÚACH AV ČR). Ich prezentácie posudzovala šesťčlenná komisia, ktorej predsedom bol RNDr. Peter Komadel, DrSc. Vyjadrila spokojnosť s vedeckou aj formálnou kvalitou prezentácií. Výsledky súťaže:

1. miesto: Mgr. Alexander Čeklovský, PhD. (ÚACH SAV)
2. miesto: Mgr. Jana Přecechtělová, PhD. (ÚACH SAV)
3. miesto: Ing. Tomáš David (Karlova univerzita, Praha)

Komisia navrhla riaditeľovi ÚACH SAV udeliť čestné uznanie kvalitným, neoceneným prácam. Čestné uznanie získali práce Ing. Františky Frajkorovej, PhD., Mgr. Anny Brtáňovej a Mgr. Romana Bystrického.

Na ÚACH aj naďalej vyvíja činnosť Snem mladých vedeckých pracovníkov, ktorý bol kreovaný ako poradný orgán riaditeľa ústavu. Snem združuje doktorandov a pracovníkov s VŠ vzdelaním do 35 rokov. Ich reprezentantka Ing. K. Ghillányová, 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 iba s doktorandským štúdiom. Výbor snemu spolu so svojimi členmi úspešne zorganizoval dňa 10.11.2011 Deň otvorených dverí na ÚACH SAV, ktorý sa konal v rámci Týždňa vedy na Slovensku.

4. Medzinárodná vedecká spolupráca

4.1. Medzinárodné vedecké podujatia

4.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2011 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia

Engineering Ceramics 2011 – from Materials to Components, Kongresové centrum Smolenice, Slovensko, 90 účastníkov, 08.05.-12.05.2011
Prínos: špeciálne vydanie medzinárodného odborného časopisu Journal of the European Ceramic Society

XXIII. International conference on coordination and bioinorganic chemistry, Smolenice, Slovakia, 125 účastníkov, 05.06.-10.06.2011

Slovenská a česká konferencia o skle, Trenčianske Teplice, 110 účastníkov, 30.11.-02.12.2011
Konferencie sa zúčastnili vedeckí pracovníci z 8 krajín - 71 účastníkov zo zahraničia.
Prezentované práce: 24 prednášok, 35 vývesok.

4.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2012 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)

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	5	7	2

4.2. Členstvo a funkcie v medzinárodných orgánoch

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

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: affiliate member v divízii II anorganická chémia)
Slovenský národný komitét IUPAC (funkcia: podpredseda/predseda)

doc. Ing. Dušan Galusek, PhD.

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

RNDr. Peter Komadel, DrSc.
Clay Mineral Society (funkcia: predseda od 2011-2015)
European Clay Groups Association (funkcia: predseda 2011-2015)

doc. Ing. Zoltán Lenčéš, PhD.
American Ceramic Society (funkcia: člen)
Ceramic Society of Japan (funkcia: člen)
European Ceramic Society (funkcia: člen)
Materials Research 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)
EuMat Technologická Platforma (funkcia: volený člen steering committee)
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. Účasť 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
Smrčok Ľubomír	Člen komisie na posudzovanie projektov pri Institute Laue-Langevin, Grenoble, Francúzsko	1
Šajgalík Pavol	Člen hodnotiaceho panelu DFG pre program SPP 1568 „Design and Generic Principles of Self-Healing Materials, Jena, Nemecko	23

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

Krátkodobé pobyty pracovníkov ústavu zamerané na riešenie projektov

Bujdák Juraj

- Ústav anorganickej chémie, Česká akadémia vied, 05. - 08. 09. 2011. Práca na interpretácii výsledkov meraní fluorescencie hybridných materiálov na báze vrstevnatých kremičitanov pomocou rôznych fluorofórov a meraní FLIM, vyhodnotenie polčasov života excitovaných stavov, práca na rukopise vedeckej publikácie "Selective modification of layered silicate nanoparticle edges with fluorophores", plánovanie budúcej spolupráce a experimentov.

Kedžuch Stanislav

- Ústav fyzikální chemie J. Heyrovského AV ČR, 02. - 13. 05. 2011. Pobyt sa uskutočnil v rámci MAD medzi SAV a AV ČR.
- Spolupráca na vývoji multireferenčných explicitne korelovaných metód v rámci bežiacich projektov LPP-0343-09 (Multireferenčná teória spriahnutých klastrov v R12 priblížení) a GACR P208/11/2222 (Explicitně korelované multireferenční metody spřažených klastrů). Dokončenie publikácie Kedžuch S., Demel O., Pittner J., Ten-no S., Noga J.: Chem. Phys. Lett. 511, 418 (2011). Kompletizácia základnej implementácie explicitne korelovanej multireferencestate-specific Mukherjee metódy (Mk-MR-CCSD(F12)), testovacie výpočty, príprava teoretického odvodenia a príprava implementácie spomenutej metódy s použitím doplnkovej pomocnej bázy (CABS) pri aproximácii podmienky úplnosti.

Komadel Peter

- Institut für Bodenforschung, Department für Wald- und Bodenwissenschaften, Viedeň, Rakúsko, 29. - 30. 11. 2011. Rokovanie o riešení projektu SK-AT-0020-10 "Molekulové simulácie vybraných organoílov – charakterizácia štruktúry a vlastnosti" a prednáška "Chemical modifications of smectites seen by selected spectroscopic techniques".

Korenko Michal

- Institute of Metal Research, Chinese Academy of Sciences, Shenyang, Čína, 5. - 19. 10. 2011. Počas pobytu bola nadviazaná spolupráca v oblasti taveninovej chémie.

Kraxner Jozef

- Solid State Chemistry and Superconductivity, Department of Inorganic and Physical Chemistry, University of Ghent. Pobyt sa uskutočnil v rámci medziakademickej spolupráce (FWO-Research Foundation-Flanders) medzi Ústavom anorganickej chémie SAV a Ústavom anorganickej a fyzikálnej chémie Belgickej akadémie vied v Gente. Náplňou práce bolo uskutočnenie experimentov ohľadom: prípravy Al_2O_3-La_2O_3 a Al_2O_3-La_2O_3-ZrO_2 roztokov, ich stabilizácie a charakterizácie, prípravy tenkých vrstiev v systéme Al_2O_3-La_2O_3, Al_2O_3-La_2O_3-ZrO_2 metódou dip coating, charakterizácie tenkých vrstiev pomocou UV-VIS (pripravených na ÚACH SAV), DTA analýza Al_2O_3-La_2O_3 and La_2O_3-ZrO_2 sklených mikroguličiek pomocou DTA. Prezentácia prednášky: Research and project activities in the Joint Laboratory of Glass Research, Vitrum Laugaricio-VILA.

Kubíková Blanka

- Institute of Engineering & Technology Open International, University of Human Development „Ukraine", Ukrajina, 19. - 24. 09. 2011. Pobyt sa uskutočnil v rámci bilaterálneho projektu APVV-0039-09 medzi SAV a ukrajinskou univerzitou. Počas pobytu boli vyhodnotené experimentálne výsledky získané pri riešení projektu: Supertvrdé a tepelne odolné jemné

prášky a povlaky boridov nióbu a tantalu; príprava, vlastnosti a použitie.

Madejová Jana

- Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Krakow, Poľsko, 06. - 10. 11. 2011. Pobyt sa uskutočnil v rámci MAD medzi SAV a PAV. Počas pobytu boli vyhodnotené experimentálne výsledky získané pri riešení projektu „Porous inorganic materials derived from layered silicates: synthesis, stability and functionality".

Pálková Helena

- Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Krakow, Poľsko, 07. - 17. 11. 2011. Pobyt sa uskutočnil v rámci medziakademickej spolupráce (MAD) medzi Ústavom anorganickej chémie SAV a Ústavom katalýzy a fyzikálnej chémie povrchov Poľskej akadémie vied v Krakowe. Náplňou práce bolo uskutočnenie experimentov zahrnutých v spoločnom projekte „Porous inorganic materials derived from layered silicates: synthesis, stability and functionality".

Pavlík Viliam

- Institute of Engineering & Technology Open International, University of Human Development „Ukraine", Ukrajina, 19. - 24. 09. 2011. Pobyt sa uskutočnil v rámci bilaterálneho projektu APVV-0039-09 medzi SAV a ukrajinskou univerzitou. Počas pobytu boli vyhodnotené experimentálne výsledky získané pri riešení projektu: Supertvrdé a tepelne odolné jemné prášky a povlaky boridov nióbu a tantalu; príprava, vlastnosti a použitie.

Prnová Anna

- Solid State Chemistry and Superconductivity, Department of Inorganic and Physical Chemistry, University of Ghent. Pobyt sa uskutočnil v rámci medziakademickej spolupráce (FWO-Research Foundation-Flanders) medzi Ústavom anorganickej chémie SAV a Ústavom anorganickej a fyzikálnej chémie Belgickej akadémie vied v Gente. Náplňou práce bolo uskutočnenie experimentov ohľadom: charakterizácie Al_2O_3-Re_2O_3 sklených mikroguličiek (pripravených na ÚACH SAV) pomocou DTA analýzy, prípravy TiO_2 roztokov ich stabilizácie a charakterizácie, prípravy TiO_2 tenkých vrstiev metódou „dip coating" a následného spekania, sledovania fotokatalytickej aktivity pripravených TiO_2 tenkých vrstiev pomocou UV spektroskopie. Prednáška: Preparation of the ceramics and glassceramics materials in the systems Re_2O_3-Al_2O_3.

Scholtzová Eva

- Universität fűr Bodenkultur Wien, Viedeň, Rakúsko, 22. - 26. 08. a 28. 11. - 09. 12. 2011. Pobyt sa uskutočnil v rámci riešenia úloh bilaterálneho projektu SK-AT-0020-10. Zhodnotili sa dosiahnuté výsledky, navrhli spôsoby prezentácie dosiahnutých výsledkov a stanovili sa ďalšie ciele a úlohy. Časť výsledkov bola prezentovaná na 63. zjazde chemikov, ktorý sa konal v Tatranských Matliaroch formou postra:
  Eva Scholtzová, Daniel Tunega, Ľubomír Benco a Helena Pálková: DFT Study of Montmorillonite Intercalated with TMA^+.

<u>Dlhodobé pobyty pracovníkov ústavu realizované na základe získania štipendií na riešenie projektov</u>

Andrejkovičová Slávka

- Department of Geosciences, University of Aveiro, Portugalsko, postdoktorandský výskumný pobyt (as assistant researcher in the area of Earth and Atmosphere sciences, subresearch field: Material science), 07. 2009 - 06. 2012. Skúmanie vplyvu pozolánovej aktivity rôznych typov metakaolínov na vlastnosti vápenných mált pre rekonštrukciu historických budov. Vplyv

ďalších aditív (sepiolit, palygorskit, zeolit) na zmenu mechanických vlastností pripravených mált.

Čeklovský Alexander

- Department of Applied Chemistry, Graduate Course of Urban Environmental Sciences, Tokyo Metropolitan University, Tokio, Japonsko, postdoktorandský výskumný pobyt, 07. 2010 - 03. 2011. Štúdium hybridných systémov zložených z ílových minerálov a metaloporfyrínov pre vývoj optických fosforescenčných senzorov kyslíka.

Hrachová Jana

- Department of Polymer Technology, Mechanical Engineering, Eindhoven University of Technology, Holandsko, postdoktorandský výskumný pobyt, 01. 04. 2010 - 31. 12. 2011. Názov projektu: Stanyl PA46 wear and friction. Projekt je zameraný na výskum rôznych druhov polyamidov, hlavne však polyamidu 4-6, pre holandského producenta DSM. Výskum zahŕňa testovanie mechanických vlastností, stanovenie odolnosti polyamidov voči poškrabaniu, treniu a opotrebovaniu vzhľadom na rozličné podmienky prostredia.

Hrobárik Peter

- Institut für Chemie, Technische Universität Berlin (10/2010-12/2011). Postdoktorandský výskumný pobyt v Nemecku podporovaný nadáciou Alexander von Humboldt. Projekt je zameraný na vývoj a aplikáciu nových relativistických metód pre výpočet a interpretáciu NMR spektier paramagnetických zlúčenín, ako aj štúdium štruktúry aktívnych centier rôznych metaloenzýmov a reakčných mechanizmov významných priemyselných katalyzátorov obsahujúcich prechodné kovy modernými metódami kvantovej chémie.

Komorovský Stanislav

- Laboratoire de Chimie et Physique Quantiques, Universite de Toulouse, Francúzsko, projekt je zameraný na teoretické štúdium narušenia parity v chirálnych molekulách. (01. 04. 2011 - 31. 03. 2012)

Korenko Michal

- Department of fluorine chemistry, Nuclear Research Institute Plc., Řež u Prahy, Česká republika, postdoktorandský výskumný pobyt, 01. 2009 - 02. 2011. Pyrochemické a pyrometalurgické separačné metódy fluidného paliva na báze roztavených solí. Elektrochemická separácia aktinoidov a lantanoidov v prostredí roztavených fluoridov.

Kucharík Marián

- Primary Metal Technology (PMT) - Technology development, Hydro Aluminium a.s. Årdal, Nórsko, projektový inžinier, 01. 11. 2008 - 31. 12. 2011. Vývoj (R&D) a inovácia technológie výroby hliníka Hall-Heroultovým procesom.

Michálek Martin

- Fachhochschule Münster - University of Applied Sciences, Nemecko, doktorandský výskumný pobyt (doktorand v oblasti konštrukčnej keramiky), 02. 2011 - 01. 2012. Funkcionalizácia uhlíkových nanorúrok (CNTs) s následnou homogénnou dispergáciou CNTs do keramickej matrice (Al_2O_3) s ohľadom na reologické vlastnosti suspenzií.

Michálková Monika

- Fachhochschule Münster - University of Applied Sciences, Nemecko, postdoktorandský výskumný pobyt (vedecký pracovník v oblasti fotochémie), 02. 2011 - 01. 2012. Postavenie LED fotoreaktora a skúmanie fotochemických reakcií v oblasti UV žiarenia a modrého svetla. Využitie rozkladných fotochemických reakcií na prípravu častíc z roztoku.

Plachký Tomáš

- Department of Material Science, Technical University Darmstadt, Darmstadt, Nemecko, 01. 08. - 28. 10. 2011. Pobyt sa uskutočnil v rámci bilatelárného projektu DAAD medzi SAV a TUD. Náplňou pobytu bola príprava polymérov na bázi polysiloxánu, ich modifikácia acetylacetátom lutécia na zlepšenie vysokoteplotných vlastností, acetátom európia na prípravu luminiscenčných materiálov a alkoxidom hliníka na prípravu Si3N4 kompozitov. Takto pripravené polyméry boli zosieťované a prípadne aj pyrolyzované a boli vyhodnotené vlastnosti týchto materiálov.

Repiský Michal

- 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. 2012.

Prednášky zahraničných pracovníkov, ktorí navštívili ÚACH SAV

Prof. Christopher BREEN, Materials and Engineering Research Institute, Sheffield Hallam University, UK,
"Using Clays to Enhance the Properties of Polymers" (11. 05. 2011)

Prof. Rajendra K. BORDIA, University of Washington, Department of Materials Science and Engineering, Seattle, USA,
"Polymer Derived Ceramic Coatings: Processing, Mechanics, and Performance" (13. 05. 2011)

Prof. I-Wei CHEN, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, USA,
"Electric Field Induced Microstructure Instability: Ionomigration, Electrosintering and Grain Growth" (21. 11. 2011)

Prof. James D. KUBICKI, Department of Geosciences, Pennsylvania State University
"Computational Chemistry and Spectroscopy of Mineral - Water Interfaces" (25. 05. 2011)

Dr. Victoria KRUPSKAYA, Laboratory of Crystal Chemistry of Minerals, Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry, Russian Academy of Science,
"Crystal Chemical Features of Kerolite-Stevensite Mixed-Layered Minerals" (6. 09. 2011)

Dr. Günter MOTZ, University of Bayreuth, Ceramic Materials Engineering, Germany,
"Development of PDC-Based Coatings" (22. 09. 2011)

Prof. G.M. ZHIDOMIROV, Institute of Catalysis, Novosibirsk, Russia,
"Molecular Models of Active Centres in Zeolite Catalysts" (19. 04. 2011)

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

5. Vedná politika

Ústav má rozpracovanú vednú politiku, ktorá je založená na inovatívnosti vedeckého smerovania, ambicióznosti vedeckých osobností, ako aj autonómnosti vedúcich vedeckých tímov. Správnosť tohto smerovania dokumentuje aj vytipovanie špičkových a nadpriemerných tímov v SAV agentúrou ARRA, keď z ÚACH sa dva tímy umiestnili medzi špičkovými a jeden ako nadpriemerný.

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 je dlhodobou úlohou vedenia ústavu. Pre zvýšenie počtu a **motivácie mladých absolventov doktorandského štúdia** navyše, 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.

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: 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. Ústav je tiež zapojený do výskumnovzdelávacieho centra excelentnosti APVV (VVCE-0033-07). Spoločne sa riešia projekty VEGA a APVV. V spolupráci s touto fakultou sa intenzívne využíva prístrojové vybavenie spoločných pracovísk (pozri 6.3.). Prof. RNDr. J. Noga, DrSc. má hlavný úväzok na fakulte. RNDr. J. Bujdák, DrSc. a doc. RNDr. M. Drábik, CSc. prešli v roku 2011 s hlavným úväzkom na fakultu, na ktorej vyučujú vybrané predmety Bc. a Mgr. štúdia. Doc. RNDr. M. Drábik, CSc. je členom Rigoróznej komisie na Katedre anorganickej chémie tejto fakulty. Prof. RNDr. J. Noga, DrSc. je externým členom Vedeckej rady ÚACH SAV. Pracovníci ÚACh viedli na PríFUK v roku 2011 šiestich doktorandov.

Názov univerzity/vysokej školy a fakulty: Fakulta prírodných vied UMB

Druh spolupráce (spoločné pracovisko alebo iné): Spolupráca v rámci projektu Rozvoj znalostných a pedagogických kompetencií pracovníkov vedy a výskumu a doktorandov na UMB

Začiatok spolupráce: 2011

Zameranie: spolupráca na pedagogickom procese

Zhodnotenie: RNDr. P. Komadel, DrSc. mal dva dni prednášok pre zamestnancov a študentov UMB na témy “Bentonity a smektity“ a “Chemicky spôsobené zmeny ílových minerálov“. Absolventky tejto fakulty Mgr. A. Brtáňová a Mgr. V. Bizovská sú internými doktorandkami ÚACH a Prírodovedeckej fakulty UK v odbore anorganická chémia. V tomto odbore nemá Fakulta prírodných vied UMB BB akreditované doktorandské štúdium, takže je možná spolupráca aj v budúcnosti s končiacimi študentami magisterského štúdia.

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 sa FCHPT v roku 2008 stala štvrtým členom konzorcia a spoluzriaďovateľom Centra kompetencie skla Vitrum Laugaricio – VILA. Doc. Ing. D. Galusek, PhD. je vedúcim Oddelenia keramiky, skla a cementu. Pracovníci ÚACh viedli na FCHPT v roku 2011 štyroch doktorandov. FCHPT je partnerom ÚACH SAV v projekte Centrum pre materiály, vrstvy a systémy pre aplikácie a chemické procesy v extrémnych podmienkach "MACHINA – Etapa I a MACHINA - Etapa II", financovaných zo ŠF, OP VaV.

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. Ing. Frajkorová, ktorá bola v r. 2011 internou doktorandkou ústavu, je absolventkou inžinierskeho štúdia Hutníckej fakulty TU. 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) rieši ÚACH SAV v spolupráci s touto univerzitou spoločné projekty VEGA. V spolupráci s TnU AD pripravil ÚACH SAV dve žiadosti o nenávratný finančný príspevok v rámci Operačného programu VaV, z ktorých jeden, projekt „Centrum excelentnosti pre keramiku, sklo a silikátové materiály" akronym CEKSIM, ITMS kód 26220120056, bol schválený na financovanie so začiatkom riešenia projektu od 09/2010. Projekt financovaný v celkovej sume 3,9 milióna € bude zameraný na vybudovanie a zriadenie centra v priestoroch TnU AD a na rozvíjanie ďalšej spolupráce medzi oboma inštitúciami. Prof. RNDr. P. Šajgalík, 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, Česká republika

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. je členom 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. Lenčéš, PhD. sú menovaní školiteľmi špecialistami týchto doktorandov. Prof. RNDr. P. Šajgalík, DrSc. je členom Vedeckej rady FMMI VŠB; doc. Ing. Z. Lenčéš, PhD. je členom odborovej rady doktorandského študijného programu Materiálové vědy a inženýrství.

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

Centrum kompetencie skla - VILA (Vitrum Laugaricio):

V roku 2011 pokračovala činnosť Centra kompetencie skla (VILA), spoločného pracoviska ÚACH SAV, TnU AD, FCHPT STU a RONA, a.s. Úlohou centra je stimulácia a rozvoj základného a aplikovaného výskumu v oblastiach súvisiacich so sklom ako materiálom, jeho výrobou a zušľachťovaním, a základný a aplikovaný výskum v oblasti pokročilých oxidových keramických a sklokeramických materiálov.

Pracovisko pre simultánnu TG-DTA analýzu:

SDT 2960 T. A. Instruments. Prístroj sa využíva pre termoanalytický výskum materiálov do teploty 1 500 °C. Popri pracovníkoch ÚACH ho využívajú na základe dohody pracovníci FCHPT STU, PríF UK a ÚSTARCH SAV pre riešenie úloh základného výskumu a pre pedagogické účely. Vedecké výsledky získané využitím tohto prístroja boli v roku 2011 predmetom viacerých spoločných publikácií a prednášok na konferenciách.

Pracovisko s vysokorozlišovacím rtg. práškovým difraktometrom:

STOE STADI-P. Partneri dohody o vytvorení tohto pracoviska sú: FCHPT STU, PríF UK a ÚACH SAV. Prístroj sa využíva hlavne na merania veľmi malých množstiev vzoriek a na získavanie dát určených na stanovenie mriežkových parametrov alebo spresňovanie kryštálových štruktúr.

Spoločné pracovisko FTIR spektroskopie:

FTIR spektrometer Nicolet Magna 750, využívajú zamestnanci partnerských pracovísk ÚACH SAV, CHÚ SAV, FCHPT STU a PríF UK. Prístroj slúži pre potreby základného výskumu a pre pedagogické účely jednotlivých užívateľov, pričom každý partner rieši svoje vlastné úlohy. V novembri 2008 bol z prostriedkov projektu APVV-VVCE (zod. riešiteľ RNDr. P. Komadel, DrSc.) zakúpený nový FTIR spektrometer Nicolet 6700 s príslušenstvom, na ktorý čiastočne prispel v roku 2009 aj CHÚ SAV. Prístroj inštalovaný v priestoroch spoločného pracoviska FTIR spektroskopie výrazne zvýšil kapacitu pracoviska a vďaka vybaveniu spektrometra prídavnými zariadeniami z prostriedkov ŠF (projekt MACHINA, ITMS kód 26240120007) sa rozšírili možnosti merania IČ spektier o nové techniky.

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

7.1. Spoločné pracoviská s aplikačnou sférou

Názov pracoviska: Centrum kompetencie skla - VITRUM LAUGARITIO

Partner(i): RONA a.s., TnU AD, FCHPT STU
Zameranie: Stimulácia a rozvoj základného a aplikovaného výskumu
Rok založenia: 2004
Zhodnotenie: V roku 2011 pokračovala činnosť Centra kompetencie skla, spoločného pracoviska ÚACH SAV, TnU AD, FChPT STU a RONA, a.s. Úlohou centra je stimulácia a rozvoj základného a aplikovaného výskumu v oblastiach súvisiacich so sklom ako materiálom, jeho výrobou a zušľachťovaním, a základný a aplikovaný výskum v oblasti pokročilých oxidových keramických a sklokeramických materiálov. V rámci centra sa v roku 2011 začalo budovať Centrum excelentnosti pre keramiku, sklo a silikátové materiálov CEKSIM. Tento projekt je podporený čiastkou 3 976 900 €. 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 €. V rámci tohto projektu bolo zriadené aj spoločné pracovisko.

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.

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): 2013
Objem získaných prostriedkov v bežnom roku (€): 12 530
Stručný opis výstupu/výsledku: Vývoj nových žiaruvzdorných materiálov na báze Al_2O_3-SiAlON a MgO-MgAlON.
Zhodnotenie: Partner RHI AG predĺžil kontrakt s ÚACH SAV o ďalšie tri roky do roku 2013.

Názov kontraktu: Analýza poškodeného povrchu skla budovy

Partner(i): Vlastníci bytov a NP v bytovom dome prostredníctvom ETP Management budov, s.r.o.
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2011
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2011

Objem získaných prostriedkov v bežnom roku (€): 1 985
Stručný opis výstupu/výsledku: Jednoznačne sa preukázalo, že problematická je nielen farebná nestálosť, ale aj chemická nestabilita použitého materiálu na fasády objektov, ktoré sú zdrojom znečistenia sklených tabúľ.

7.3. Iná činnosť využiteľná pre potreby hospodárskej praxe

Vypracovaný "Technický audit na posúdenie výšky potrebných minimálnych kapitálových výdavkov, ktoré sú potrebné na podporu plánovaného rastu spoločnosti RONA a.s., Lednické Rovne, počas obdobia biznis plánu na r. 2012 – 2013".

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
doc. Ing. Dušan Galusek, PhD.	Ministerstvo obrany Slovenskej republiky	národný expert SR v European Defense Agency
	Komisia pre námietky pri verejnom obstarávaní	externý člen
Mgr. Stanislav Kedžuch, PhD.	Slovenská komisia chemickej olympiády	člen
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.	Agentúra na podporu výskumu a vývoja - komisia pre nový spôsob hodnotenia projektov	predseda
	Slovenská komisia pre vedecké hodnosti (SKVH)	predseda
	Komisia ministra školstva pre udeľovanie Ceny ministra školstva	člen
	Agentúra na podporu výskumu a vývoja - podpora prípravy projektov 7. Rámcového programu výskumu a vývoja	člen komisie
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 samosprávy

Názov expertízy: Spoluautor úloh Chemickej olympiády
Adresát expertízy: MŠ SR
Spracoval: Mgr. Stanislav Kedžuch, PhD.

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

8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnymi 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	Typ[1]	Názov	Miesto zverejnenia	Dátum
RNDr. Juraj Bujdák, DrSc.	RO	Príspevok o fluorescenčnom spektrofotometri v relácii Mozaika regiónu	Rádio Regina	14.6.2011
doc. RNDr. Milan Drábik, CSc. .	PB	Celosvetový chemický experiment pre žiakov a študentov v SR	konferencia „Quo vadis vyučovanie k vede a technike", Tyždňa vedy a techniky	7.11.2011
	TL	Globálny chemický experiment pre Medzinárodný rok chémie 2011	ChemZi 6/12, 59-61 (2010, vyšlo v r. 2011)	2011
	PB	Voda – chemické riešenie alebo chemický roztok	Vedecká cukráreň, na pozvanie CVTI SR a Mladí vedci s.r.o.	18.10.2011
	TV	Voda naša každodenná	TV Bratislava, regionálna televízia	20.10.2011
Mgr. Stanislav Kedžuch, PhD.	PB	3. Odborné sústredenie z chémie, biológie a prírodných vied pre študentov základných a stredných škôl	Bardejov	28.5.2011
	TL	Riešenie a hodnotenie úloh zo všeobecnej a fyzikálnej chémie (II)	CHEMICKÉ ROZHĽADY, 1 / 2011, ISSN 1335–8391	2011
	TL	Úlohy zo všeobecnej a fyzikálnej chémie (II)	CHEMICKÉ ROZHĽADY, 1 / 2011, ISSN 1335–8391	2011
RNDr. Peter Komadel, DrSc.	TL	Špičkovú vedu pod Tatrami robia Amerikánci	Trend	1.12.2011
Ing. Michal Korenko, PhD.	TL	"Marťan" Edward Teller Maďarská stopa pri vývoji jadrovej a vodíkovej bomby	História 1-2/2011/ Človek a doba	2011
	TL	Je ropa naozaj fosílne palivo?	Quark	1.1.2011
	TL	Zukunft slowakischer Kernkraftwerke	Neue Wiener Online Zeitung	30.6.2011
Dr. Vladimír Malkin, DrSc. Dr. Oľga Malkin	PB	Prednáška v ramci The Euro-Indian week in Wuerzburg: Relativistic quantum-mechanical simulations of NMR and EPR spectra and their impact on life around us.	Wuerzburg, Germany	8.7.2011
prof. RNDr. Jozef Noga, DrSc.	TL	Rozhovor pre rubriku Veda	Denník SME	4.12.2011
prof. RNDr. Pavol Šajgalík, DrSc.	RO	Analýza povrchu materiálov a metóda röntgenovej fotoelektrónovej spektroskopie v relácii Solaris	Rádio Regina	21.1.2011
	RO	Desať minút s vedou - rozhovor	Slovenský rohlas - rádio Devín	24.10.2011

prof. RNDr. Pavol Šajgalík, DrSc.	RO	Hodina s vedcom	Slovenský rozhlas - Rádio Regina	20.10.2011
	TV	Metamorfózy keramiky - rozhovor	Televízia TA3	30.10.2011
	PB	Metamorfózy keramiky: od Vestonickej Venuše po nepriestrelné panciere	Vedecká kaviareň	27.10.2011
	TL	Najlepšie v roku 2010: Supermateriál grafén skúmajú aj na Slovensku	Denník SME	7.1.2011
	TL	Našim predkom spadla hlina do ohňa asi náhodou	Denník SME	25.9.2011
	TL	Nový prístroj bombardovaním určuje povrch materiálu	Pravda	21.1.2011
	TL	Prečo má raketoplán keramický plášť?	Denník SME	30.7.2011
	PB	Prečo má raketoplán keramický plášť?	Detská univerzita Komenského, Divadlo Aréna	20.7.2011
	TL	Vyvinuli pancier z keramiky	Haló Bratislava, č.1, str. 20	2011

[1] *PB - prednáška/beseda, TL - tlač, TV - televízia, RO - rozhlas, IN - internet, EX - exkurzia, PU - publikácia, MM - multimédiá, 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	9	tlač	19	TV	2
rozhlas	8	internet	0	exkurzie	1
publikácie	0	multimediálne nosiče	0	dokumentárne filmy	0

9.2. Vedecko-organizačná činnosť

Tabuľka 9c Vedecko-organizačná činnosť

Názov podujatia	Domáca/ medzinárodná	Miesto	Dátum konania	Počet účastníkov
Engineering Ceramics 2011 from Materials to Components	medzinárodná	Kongresové centrum Smolenice, Slovensko	08.05.-12.05.2011	90
XXIII. International conference on coordination and bioinorganic chemistry	medzinárodná	Smolenice, Slovakia	05.06.-10.06.2011	125
Slovenská a česká konferencia o skle	medzinárodná	Trenčianske Teplice	30.11.-02.12.2011	110

9.3. Účasť na výstavách

Názov výstavy: CONECO, 32. medzinárodný veľtrh stavebníctva
Miesto konania: Incheba Expo, Bratislava
Dátum: 29. 3. 2011

Zhodnotenie účasti: V dňoch 29. 03. - 02. 04. 2011 sa v rámci stánku SAV prezentoval Ústav anorganickej chémie SAV. V rámci výskumno-vývojových aktivít ústavu bol prezentovaný prístroj na prípravu hutných konštrukčných keramických materiálov metódou horúceho lisovania. Tento prístroj bol vyvinutý a skonštruovaný pracovníkmi ústavu a svojou konštrukciou a technickými parametrami (pracovná teplota do 2 000°C, redukčná atmosféra, mechanický tlak do 40 MPa) patrí do skupiny výnimočných.

Názov výstavy: Chemistry Slovakia 2011, veľtrh
Miesto konania: Incheba Expo, Bratislava
Dátum: 12. 4. 2011
Zhodnotenie účasti: Ústav anorganickej chémie a Centrum excelentnosti CE MACHINA II boli v dňoch 12. - 14. 04. 2011 prezentované na veľtrhu Chemistry Slovakia 2011 v bratislavskej Inchebe. Návštevníci a záujemcovia získali informácie o projekte a zároveň im boli rozdávané propagačné materiály. Prof. RNDr. P. Šajgalík, DrSc. pre návštevníkov veľtrhu predniesol prednášku na tému: „Nezničiteľné materiály na každý deň"

Názov výstavy: Noc výskumníka
Miesto konania: Nákupné centrum AVION, Bratislava
Dátum: 23. 9. 2011
Zhodnotenie účasti: V rámci Noci výskumníka prezentovalo oddelenie keramiky výsledky výskumu a vývoja syntetických luminofórov. Luminofóry sú látky, ktoré transformujú elektromagnetické vlnenie istej vlnovej dĺžky do oblasti viditeľného svetla. Keď takýmito látkami pokryjeme povrch LED diódy vyžarujúcej na jednej vlnovej dĺžke, môžeme ju pomocou nich transformovať do rôznych farieb viditeľného svetla tak, aby sme získali biele svetlo. Na jednoduchom príklade boli širokej verejnosti prezentované výhody použitia LED diód oproti wolfrámovej žiarovke. Výmenou wolfrámovej žiarovky za LED lampu dokážeme pri tom istom svetelnom výkone ušetriť až 97 % energie. Prezentácia pritiahla mnoho záujemcov, ktorí mali veľa, prevažne praktických otázok týkajúcich sa hlavne úspory elektrickej energie v domácnosti. Prof. RNDr. P. Šajgalík, DrSc. predniesol dva príspevky v rámci Noci výskumníkov: prednáška vo Vedeckej kaviarni „Inovačný trojuholník"; prednáška v SNM-PM „Nezničiteľné materiály na každý deň".

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	1	0	0

9.5. Členstvo v redakčných radách časopisov

doc. Ing. Miroslav Boča, PhD.
Chemical Papers (funkcia: Associate editor pre anorganickú chémiu)

doc. RNDr. Milan Drábik, CSc.
Ceramics-Silikáty (funkcia: člen)
ChemZi (funkcia: člen)

doc. Ing. Dušan Galusek, PhD.
Ceramics-Silikáty (funkcia: člen)

RNDr. Peter Komadel, DrSc.
Applied Clay Science (funkcia: člen)
Clay Minerals (funkcia: člen)
Clays and 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)
Sklář a keramik (funkcia: člen)

prof. RNDr. Pavol Šajgalík, DrSc.
Ceramics-Silikáty (funkcia: člen)
Journal of Ceramic Science and Technology (funkcia: člen)
Keramický Zpravodaj (funkcia: člen)
Key Engineering Materials (funkcia: člen International Advisory Board)
Processing and Application of Ceramics (funkcia: člen)

9.6. Činnosť v domácich vedeckých spoločnostiach

Mgr. Slávka Andrejkovičová, PhD.
Slovenská ílová spoločnosť (funkcia: člen)

Ing. Peter Barborík

Slovenská chemická spoločnosť (funkcia: člen)

Mgr Valéria Bizovská

Slovenská ílová spoločnosť (funkcia: člen)

doc. Ing. Miroslav Boča, PhD.

Humboldtov klub v SR (funkcia: člen)
Slovenská chemická spoločnosť (funkcia: člen)

Mgr. Anna Brtáňová

Slovenská ílová spoločnosť (funkcia: člen)

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.

Asociácia slovenských chemických a farmaceutických spoločností (ASCHFS) (funkcia: predseda)
Slovenská chemická spoločnosť (funkcia: podpredseda Predsedníctva SCHS (od r. 2009))
Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)

doc. Ing. Dušan Galusek, PhD.

Humboldtov klub v SR (funkcia: člen)
Slovenská silikátová vedecko-technická spoločnosť (funkcia: člen)
Slovenská sklárska spoločnosť (funkcia: člen predstavenstva, vedecký tajomník)

Ing. Veronika Gurišová

Slovenská chemická spoločnosť (funkcia: člen)

RNDr. Jana Hrachová, PhD.

Slovenská chemická spoločnosť (funkcia: člen)
Slovenská ílová 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)

RNDr. Peter Komadel, DrSc.

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. Blanka Kubíková, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

Ing. Marián Kucharík, PhD.

Slovenská chemická spoločnosť (funkcia: člen)

doc. Ing. Zoltán Lenčéš, PhD.

Humboldtov klub v SR (funkcia: člen)

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

prof. Ing. Marek Liška, DrSc.

Slovenská sklárska spoločnosť (funkcia: podpredseda)

RNDr. Jana Madejová, DrSc.

Slovenská chemická spoločnosť (funkcia: člen)
Slovenská ílová spoločnosť (funkcia: predseda)

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)

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. Jaroslav Sedláček, PhD.

Slovenská silikátová vedecko-technická 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

Dňa 10. 11. 2011 pripravil Ústav anorganickej chémie SAV v rámci Týždňa vedy a techniky na Slovensku 2011 „Deň otvorených dverí ÚACH SAV“. Celodenný program začal krátkym privítaním návštevníkov vo vestibule budovy, kde sa návštevníci mohli zoznámiť s programom, ktorý bol pre nich pripravený. Pre návštevníkov boli pripravené dve prezentácie. Jedna z oblasti keramiky – „Prečo má raketa keramický plášť?“ a druhá o využití výpočtovej techniky pri riešení problémov v chémii s názvom „Chémia v počítači“. Návštevníci si prezreli vybrané laboratóriá, kde im bol poskytnutý odborný výklad prezentujúci zameranie jednotlivých oddelení ÚACH SAV. Prezreli si taktiež najnovšie prístrojové vybavenie pracoviska a pracovníci ústavu im predviedli praktické ukážky niektorých chemických experimentov. Zaujímavá prezentácia bola pre návštevníkov pripravená na skenovacom elektrónovom mikroskope v spolupráci so Slovenskou silikátovou vedecko-technickou spoločnosťou. Návštevníci si mohli pozrieť aj výstavku finálnych produktov, ktoré vznikli na základe výskumu na ÚACH. Počas celého dňa bolo možné sledovať vývesné tabule s tématikou výskumu ústavu. K dispozícii boli propagačné materiály, výtlačky vedeckých časopisov a powerpointová prezentácia o Ústave anorganickej chémie SAV, doplnená krátkymi videami z oblasti priemyslu. Jedna obrazová prezentácia bola venovaná aktuálnemu Roku chémie. Dňa otvorených dverí sa zúčastnilo okolo 80 študentov z bratislavských i mimobratislavských stredných i vysokých škôl.

10. Činnosť knižnično-informačného pracoviska

10.1. Knižničný fond

Tabuľka 10a Knižničný fond

Knižničné jednotky spolu		7483
z toho	knihy a zviazané periodiká	7483
	audiovizuálne dokumenty	
	elektronické dokumenty (vrátane digitálnych)	
	mikroformy	
	iné špeciálne dokumenty - dizertácie, výskumné správy	
Počet titulov dochádzajúcich periodík		8
z toho zahraničné periodiká		6
Ročný prírastok knižničných jednotiek		16
v tom	kúpou	16
	darom	
	výmenou	
	bezodplatným prevodom	
Úbytky knižničných jednotiek		
Knižničné jednotky spracované automatizovane		

10.2. Výpožičky a služby

Tabuľka 10b Výpožičky a služby

Výpožičky spolu		140
z toho	odborná literatúra pre dospelých	
	výpožičky periodík	60
	prezenčné výpožičky	
MVS iným knižniciam		
MVS z iných knižníc		
MMVS iným knižniciam		
MMVS z iných knižníc		80
Počet vypracovaných bibliografií		
Počet vypracovaných rešerší		

10.3. Používatelia

Tabuľka 10c Užívatelia

Registrovaní používatelia	
Návštevníci knižnice spolu (bez návštevníkov podujatí)	200

10.4. Iné údaje

Tabuľka 10d Iné údaje

On-line katalóg knižnice na internete (1=áno, 0=nie)	
Náklady na nákup knižničného fondu v €	2232,15

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.

- Predseda rady riaditeľov 2. Oddelenia vied

11.3. Členstvo vo vedeckých kolégiách SAV

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

prof. RNDr. Jozef Noga, DrSc.

- Komisia SAV pre spoluprácu s vysokými školami (člen)

prof. RNDr. Pavol Šajgalík, DrSc.

- Komisia SAV pre vednú politiku a prognózy vývoja vedy a spoločnosti (člen)

11.5. Členstvo v orgánoch VEGA

doc. Ing. Dušan Galusek, PhD.

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

prof. Ing. Marek Liška, DrSc.

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

RNDr. Jana Madejová, DrSc.

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

Dr. Vladimír Malkin, DrSc.

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

12. Hospodárenie organizácie

12.1. Výdavky RO SAV

Tabuľka 12a Výdavky RO SAV (v €)

Kategória	Posledný upravený rozpočet r. 2011	Čerpanie k 31.12.2011 celkom	z toho:	
			z rozpočtu	z mimoroz. zdrojov
Výdavky spolu	4 278 054	4 676 915	4 136 050	540 865
z toho:				
- kapitálové výdavky	2 898 389	2 824 608	2 756 389	68 219
- bežné výdavky	1 379 665	1 852 307	1 379 661	472 646
z toho:				
- mzdové výdavky	720 483	836 491	720 483	116 008
odvody do poisťovní a NÚP	252 023	285 010	252 023	32 987
- tovary a ďalšie služby	407 157	730 806	407 155	323 651
z toho:				
- výdavky na projekty (VEGA, APVV, ŠPVV, MVTP, ESF)	402 917	726 566	402 915	323651
- výdavky na periodickú tlač				
- transfery na vedeckú výchovu	4 240	4 240	4 240	0

12.2. Príjmy RO SAV

Tabuľka 12b Príjmy RO SAV (v €)

Kategória	Posledný upravený rozpočet r. 2011	Plnenie k 31.12.2011
Príjmy spolu:	9 528	553 395
z toho:		
rozpočtované príjmy (účet 19)	9 528	9 528
z toho:		
- príjmy za nájomné		
mimorozpočtové príjmy (účet 780)	0	543 867

13. Nadácie a fondy pri organizácii SAV

14. Iné významné činnosti organizácie SAV

15. Vyznamenania, ocenenia a ceny udelené pracovníkom organizácie v roku 2011

15.1. Domáce ocenenia

15.1.1. Ocenenia SAV

15.1.2. Iné domáce ocenenia

Identifikácia špičkových vedeckých tímov a ich členov na SAV

Oceňovateľ: Akademická rankingová a ratingová agentúra
Opis:. Vedecké tímy SAV boli použitím kombinácie viacerých kvantitatívnych a kvalitatívnych kritérií porovnané so svetovou špičkou v danom odbore.
Špičkový tím: Oddelenie hydrosilikátov (počet členov 10, vedúci - Komadel & Bujdák)
Oddelenie teoretickej chémie (počet členov 6, vedúci - O. Malkin & Noga)
Nadpriemerný tím: Oddelenie keramiky (počet členov 14, vedúci - Šajgalík)

Madejová Jana

Prémia za trojročný vedecký ohlas za rok 2011 v kategórii technické vedy a geovedy (I. miesto)
Oceňovateľ: Slovenský literárny fond

15.2. Medzinárodné ocenenia

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

Ústav je zapojený do desiatich projektov ŠF EÚ v operačnom programe VaV. Problémy s neflexibilnosťou a prebyrokratizovanosťou ASFEU sú už notoricky známe a dokonca medializované aj najvyššími predstaviteľmi decíznej sféry. Napriek tomu k náprave v tejto oblasti nedošlo. Dokonca sa problémy s ASFEU vyvíjajú do ešte absurdnejších rozmerov. Ako modelový príklad by mohla slúžiť nasledovná skúsenosť ÚACH.
Agentúra pozastavila Žiadosť o platbu ústavu (v októbri roku 2011) vzhľadom na fakt, že pracovník ústavu Ing. F. Šimko, PhD. (100 % úväzok zo ŠF) v pracovnom výkaze uviedol služobnú cestu na vedecké podujatie do Brna, ktorá bola financovaná z prostriedkov VEGA. Agentúra argumentuje tým, že pracovník na 100 % úväzku zo ŠF nesmie vykonávať činnosť na iných projektoch a nesmie byť ani z nich financovaný.
Absurdita tohto názoru spočíva v dvoch rovinách; tá prvá je logická, pretože základným cieľom projektov ŠF je zvýšenie konkurencieschopnosti vedy na Slovensku v získavaní prostriedkov na vedu a výskum. Druhej rovine chýba akákoľvek logika. Prostriedky VEGA sú interné prostriedky kapitoly SAV, len sú distribuované zásluhovým spôsobom a nie paušálnym rozpisom. Je to interná záležitosť SAV. Teda, Ing. F. Šimko, PhD., prísne vzaté, použil na svoju cestu do Brna inštitucionálne prostriedky, také isté ako sú inštitucionálne prostriedky, ktorými ústav kryje náklady na teplo, elektrickú energiu, zariadenie kancelárie, výpočtovú techniku a náklady (a to nesmierne vysoké) na administratívne spracovanie požiadaviek ASFEU, týkajúce sa F. Šimka.
Vedenie SAV by mohlo váhou svojej autority pomôcť riešiteľom projektov ŠF vyriešiť aspoň problémy týkajúce sa prostriedkov VEGA vo vzťahu k ASFEU.

Správu o činnosti organizácie SAV spracoval(i): RNDr. Jana Madejová, DrSc.
Ing. Helena Pálková, PhD.

Riaditeľ organizácie SAV:

.....
prof. RNDr. Pavol Šajgalík, DrSc.

Prílohy

Príloha A - Zoznam zamestnancov a doktorandov organizácie k 31.12.2011

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

	Meno s titulmi	Úväzok (v %)	Ročný prepočítaný úväzok
Vedúci vedeckí pracovníci DrSc.			
1.	RNDr. Juraj Bujdák, DrSc.	50	0.83
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.	100	1.00
Samostatní vedeckí pracovníci			
1.	doc. Ing. Miroslav Boča, PhD.	100	1.00
2.	Mgr. Adriana Czímerová, PhD.	100	1.00
3.	doc. RNDr. Milan Drábik, CSc.	50	0.83
4.	doc. Ing. Dušan Galusek, PhD.	100	1.00
5.	doc. Ing. Miroslav Hnatko, PhD.	100	1.00
6.	Ing. Štefan Kavecký, CSc.	33	0.33
7.	doc. Ing. Zoltán Lenčéš, PhD.	100	1.00
8.	doc. Ing. Pavel Mach, CSc.	25	0.25
9.	Ing. Ivan Nerád, CSc.	100	1.00
10.	Ing. Eva Scholtzová, CSc.	100	1.00
11.	RNDr. Ľubomír Smrčok, CSc.	100	1.00
Vedeckí pracovníci			
1.	Mgr. Slávka Andrejkovičová, PhD.	0	0.00
2.	James Richard Asher, PhD	100	0.30
3.	Ing. Tomáš Bučko, PhD.	25	0.25
4.	Mgr. Alexander Čeklovský, PhD.	100	0.50
5.	Ing. Františka Frajkorová, PhD.	100	0.25
6.	Ing. Dagmar Galusková, PhD.	13	0.13
7.	Ing. Katarína Ghillányová, PhD.	100	1.00
8.	RNDr. Jana Hrachová, PhD.	0	0.00

9.	Mgr. Peter Hrobárik, PhD.	0	0.00
10.	Ing. Jozef Chovanec, PhD.	100	0.25
11.	Ing. Mária Chromčíková, PhD.	100	1.00
12.	Mgr. Ľuboš Jankovič, PhD.	100	1.00
13.	Mgr. Stanislav Kedžuch, PhD.	100	1.00
14.	Ing. Róbert Klement, PhD.	27	0.27
15.	Mgr. Stanislav Komorovský, PhD.	100	0.00
16.	Ing. Michal Korenko, PhD.	100	1.00
17.	Ing. Jozef Kraxner, PhD.	100	0.45
18.	Ing. Blanka Kubíková, PhD.	100	1.00
19.	Ing. Marián Kucharík, PhD.	0	0.00
20.	Ing. Monika Michálková, PhD.	0	0.00
21.	Ing. Jarmila Mlynáriková, PhD.	0	0.00
22.	Ing. Zuzana Netriová, PhD.	0	0.00
23.	Ing. Helena Pálková, PhD.	100	1.00
24.	Ing. Viliam Pavlík, PhD.	100	1.00
25.	Ing. Martin Pentrák, PhD.	100	1.00
26.	Ing. Linda Pentráková, PhD.	100	1.00
27.	Ing. Tomáš Plachký, PhD.	100	1.00
28.	doc. Ing. Alfonz Plško, CSc.	28	0.28
29.	Mgr. Jana Přecechtělová, PhD.	100	0.43
30.	Ing. Anna Prnová, PhD.	100	1.00
31.	Mgr. Michal Repiský, PhD.	0	0.00
32.	Ing. Jaroslav Sedláček, PhD.	100	1.00
33.	Ing. František Šimko, PhD.	100	1.00
34.	doc. Ing. Peter Šimurka, PhD.	100	1.00
35.	Mgr. Peter Švančárek, PhD.	100	1.00
36.	Ing. Jana Valúchová, PhD.	0	0.00
37.	Ing. Štefan Varga, CSc.	100	1.00
38.	Ing. Zuzana Vasková, PhD.	100	1.00
39.	Ing. Martin Vitkovič, PhD.	100	1.00
Odborní pracovníci s VŠ vzdelaním			
1.	Bc. Martina Bukovská	100	1.00
2.	Ing. Katarína Faturíková	100	1.00
3.	prom.farm. Ľubica Gáliková	100	1.00

4.	Ing. Veronika Gurišová	100	1.00
5.	Ing. Tomáš Hanulík	28	0.28
6.	Ing. Ingrid Hierwegová	94	0.94
7.	Bc. Katarína Hlavačková	80	0.80
8.	Ing. Monika Hrabalová	100	0.16
9.	RNDr. Klára Hrnčiarová	40	0.40
10.	Mgr. Natália Jamrichová	100	1.00
11.	Ing. Petra Jeřábková	0	0.00
12.	Ing. Hana Kaňková	100	1.00
13.	Ing. Ľubomír Koleda	100	1.00
14.	Ing. Judita Lilová	50	0.50
15.	Ing. Iveta Macková	100	1.00
16.	Mgr. Marián Matejdes	30	0.30
17.	Ing. Eva Mikšíková	125	1.25
18.	Ing. Ján Piško	100	1.00
19.	Ing. Jozef Priščák	100	1.00
20.	Ing. Zuzana Slobodová	100	1.00
21.	Ing. Katarína Šovčíková	40	0.40
22.	Ing. Eva Špyrková	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.	Miriam Hnatková	0	0.00
6.	Anna Jurová	100	1.00
7.	Zdena Kapišinská	100	1.00
8.	Magdaléna Kňazovičová	125	1.25
9.	Anna Kovárová	100	1.00
10.	Zora Lukáčová	100	1.00
11.	Jozef Sitár	100	1.00
12.	Anna Škumátová	100	0.25
13.	Alexandra Tonkovičová	100	1.00
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.	Mgr. Ľubomír Hric, PhD.	31.3.2011	0.25
Odborní pracovníci s VŠ vzdelaním			
1.	Ing. Katarína Podešlová	30.4.2011	0.31

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. Anna Brtáňová	Prírodovedecká fakulta UK	4.1.15 anorganická chémia
3.	Mgr. Roman Bystrický	Prírodovedecká fakulta UK	4.1.15 anorganická chémia
4.	Mgr. Magdalena 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.	Ing. Martin Michálek	Fakulta chemickej a potravinárskej technológie STU	5.2.19 anorganická technológia a materiály
7.	Ing. Samuel Sas	Fakulta chemickej a potravinárskej technológie STU	5.2.19 anorganická technológia a materiály
8.	Mgr. Michal Vetrecin	Prírodovedecká fakulta UK	4.1.15 anorganická chémia
Interní doktorandi hradení z iných zdrojov			
1.	Ing. Peter Barborík	Fakulta chemickej a potravinárskej technológie STU	5.2.19 anorganická technológia a materiály
2.	Mgr. Anežka Křístková	Prírodovedecká fakulta UK	4.1.11 chemická fyzika
Externí doktorandi			
1.	Ing. Jana Sabošová	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.) Fluorescenčné hybridné vrstevnaté materiály *(Hybrid layered materials with fluorescent properties.)*

Zodpovedný riešiteľ:	Juraj Bujdák
Trvanie projektu:	1.1.2009 / 31.12.2011
Evidenčné číslo projektu:	
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	1 - Česko: 1
Čerpané financie:	

Dosiahnuté výsledky:

Dokončili sa práce na charakterizácii hybridných materiálov pripravených kondenzáciou reaktívnych silánov na hranách častíc smektitu. Pomocou spektrálnych metód sa zistilo zachovanie fotofyzikálnych vlastnosti fluorofórov v týchto materiáloch. Fluorescenčná spektroskopia potvrdila heterogénne rozloženie fluorofórov v niektorých vzorkách. Spísala sa publikácia a zaslala do časopisu Applied Clay Science. Naplánovali sa témy budúcej vedeckej spolupráce.

2.) Uhlíkovými vláknami a nanotrubkami spevnené a zhúževnatené keramické materiály určené pre aplikácie pri extrémne vysokých teplotách *(High strength and toughness ultra high temperature ceramics reinforced by fibers and carbon nanotubes)*

Zodpovedný riešiteľ:	Zoltán Lenčéš
Trvanie projektu:	1.1.2010 / 31.12.2012
Evidenčné číslo projektu:	MAD CNR-SAV-č. 12
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	1 - Taliansko: 1
Čerpané financie:	

Dosiahnuté výsledky:

Projekt je zameraný na prípravu keramického kompozitu na báze ZrB_2 spevneného SiC vláknami a predĺženými časticami (whiskrami). Boli pripravené referenčné materiály ZrB_2 s 5% prídavkom nepovlakovaných SiC vlákien a whiskrov. Aby sa dosiahlo zhúževnatenia krehkej ZrB_2 matrice, na vláknach a whiskroch SiC bola pripravená inertná BN vrstva z roztokov 0,3 M a 0,1 M H_3BO_3 karbotermickou redukciou a následnou nitridáciou. Lepšie výsledky (tzn. hrúbka a priľnavosť BN vrstvy) boli dosiahnuté z 0,1 M H_3BO_3 roztoku. Povlakované vlákna a whiskre boli pridané k ZrB_2 matrici a zhutňované žiarovým lisovaním pri teplote 1850 °C v atmosfére argónu. Hustota keramických kompozitov po spekaní bola na úrovni 92-95%. V ďalších experimentoch bude nutné optimalizovať režim spekania.

Experimenty na vytvorenie povlakov na SiC vláknach a whiskroch z prekurzoru Zr-Ti-B-(O) ukázali na nedostatok bóru v produkte po karbotermickej redukcii a nitridácii. Ďalšia činnosť bude zameraná na zvýšenie bóru v Zr-Ti-B-(O) prekurzore pridaním boránov.

Doterajšie výsledky sú zhrnuté v prácach:

Bača Ľ., Lenčéš Z., Stelzer N.: Phase, microstructure evolution and sintering of Sr-doped TiB_2 precursors. In *Journal of European Ceramic Society* **31** (2011) 1465-1471.

Šajgalík P., Lenčéš Z., Plachký T., Riedel R.: Low temperature densification of non-oxide ceramic composites by using polymer derived Si(Al, Lu)OC as a sintering aid. *7th International Conference on High-Performance Ceramics* 2011, Xiamen, China, Book of Abstracts p. 205.

Bača Ľ., Vitkovič M., Jogl C., Neubauer E., Merstallinger A., Šajgalík P.: Microstructure evolution and tribological properties of Ti_{B2}-based cermets. In *Engineering Ceramics 2011*, Smolenice, Book of Abstracts and Programme p. 63.

3.) Pórovité anorganické materiály pripravené z vrstevnatých silikátov – syntéza, stabilita a funkčnosť *(Porous inorganic materials based on layered silicates – synthesis, stability, and functionality)*

Zodpovedný riešiteľ:	Jana Madejová
Trvanie projektu:	1.1.2010 / 31.12.2012
Evidenčné číslo projektu:	MAD 19/2010
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	1 - Poľsko: 1
Čerpané financie:	

Dosiahnuté výsledky:

Testovali sa dva spôsoby aluminácie pórových materiálov pripravených z organo-ílov (PCH - porous clay heterostructures), aluminácia priamo počas syntézy PCH a post-syntézová aluminácia. Výsledky ukázali, že perspektívnejším spôsobom prípravy je aluminácia priamom počas syntézy PCH. Týmto spôsobom je možné pripraviť materiály s lepšou pórovitosťou a s vyšším merným povrch. Výsledky projektu, súvisiace s charakterizáciou vlastností organo-ílov boli publikované v práci:

H. Pálková, Ľ. Jankovič, M. Zimowska, J. Madejová, Alterations of the surface and morphology of tetraalkyl-ammonium modified montmorillonites upon acid treatment. In Journal of Colloid and Interface Science 2011 363, 213-222.

4.) Príprava a charakterizácia nanokompozitných keramických materiálov na báze Al_2O_3 a Si_3N_4 pre rezanie ťažko obrábateľných materiálov *(Preparation and characterization of alumina and silicon nitride-based nanocomposites for cutting of hard-to machine materials)*

Zodpovedný riešiteľ:	Pavol Šajgalík
Trvanie projektu:	1.1.2010 / 31.12.2012
Evidenčné číslo projektu:	SAS-NSC-2010-02
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	1 - Taiwan: 1
Čerpané financie:	
Podpora medzinárodnej spolupráce z národných zdrojov:	40000 €

Dosiahnuté výsledky:

Výsledky, ktoré sme získali v prvej etape riešenia projektu dávali predpoklad k jeho ďalšiemu úspešnému pokračovaniu. Pochopenie mechanizmu tvorby SiC fázy cestou karbotermickej redukcie SiO_2 *in situ* v procese spekania nám umožnilo horúcim lisovaním pripraviť hutné Si_3N_4/SiC mikro/nano kompozity s rôznym zložením fázy na hraniciach zŕn (Lu_2O_3, Yb_2O_3, Y_2O_3, Sm_2O_3, Nd_2O_3, La_2O_3). Kompozity boli charakterizované z hľadiska ich mechanických vlastností, ktoré sú predpokladom na ich využitie v oblasti obrábania tvrdých, ťažko obrábateľných kovových zliatin. Mechanické vlastnosti (tvrdosť, lómová húževnatosť, pevnosť) sa zvyšujú so znižovaním iónového polomeru Re^{3+} katiónu použitej prísady spekania. Dodatočne sa vykonali rezné testy Si_3N_4/SiC kompozitu s prídavkom Y_2O_3. Výsledky rezných testov potvrdzujú predpoklad o výnimočných rezných vlastnostiach, ktorý bol vyslovený na základe nameraných mechanických vlastností pripravených kompozitov. Z výsledku vyplýva, že v porovnaní s komerčne dostupnými keramickými nástrojmi (SN300®, KY3500®) má nami pripravený kompozit tri-krát výššiu životnosť.

V druhej etape projektu bola snaha pripraviť rovnako kvalitný materiál technikou GPS (gass pressure sintering), ktorá je z hľadiska komerčného využitia výhodnejšia v porovnaní s horúcim lisovaním. Podľa predpokladu, ak sme použili rovnaké zloženie východiskovej zmesi, ako pri horúcom lisovaní a mierne modifikovaný režim spekania (T=1850°C, 2 hod. N2 atmosféra 40MPa), získali sme pórovitý materiál (30-40% pórovitosť – nevhodné pre požadované aplikácie). V takto pripravenom materiály nebola detegovaná SiC fáza. Je teda potrebné optimalizovať chemické zloženie východiskových zmesí, ktoré by vyhovovali novej technike zhutňovania z hľadiska prípravy hutného Si_3N_4/SiC mikro/nano kompozitného materiálu s dobrými reznými vlastnosťami. Celý proces prípravy kompozitu touto technológiou je možné rozdeliť do dvoch častí. V prvej časti (do teploty 1550°C) je dôležitým predpokladom získať v systéme karbotermickou redukciou SiO_2 (resp. Si_3N_4) čo naväčší podiel SiC fázy (do 5 hm%). Je potrebné termodynamicky a kineticky zvládnuť priebeh možných reakcii vzniku SiC v danom systéme:

$SiO_2(s) + 3C(s) = SiC(s) + 2CO(g)$ $K_{(1540°C)} = 2.3$, $\Delta G°_{(1540°C)} = -12.3$ kJ/mol

a

$Si_3N_4(s) + 3C(s) = 3SiC(s) + 2N_2(g)$ $K_{(1540°C)} = 2.2$, $\Delta G°_{(1540°C)} = -32.5$ kJ/mol

V druhej časti procesu (v teplotnom intervale 1800 – 1950°C) je potrebné celý systém zhutniť.
Z modelových experimentov v systémoch SiO_2–C, SiO_2-Y_2O_3-C, Si_3N_4-C a Si_3N_4-SiO_2-C, ktoré boli zahrievané v teplotnom intervale do 1550°C vo vákuu, prípadne v atmosphere argónu, boli získané prvé dôležité výsledky pre optimalizáciu chemického zloženia východiskových zmesí ako aj režimu spekania metódou GPS. Z doterajších výsledkov vyplýva, že ide o úplne odlišné podmienky v porovnaní s podmienkami pri horúcom lisovaní a to z termodynamického, aj z kinetického hľadiska. Výsledky druhej etapy projektu sú v štádiu vyhodnocovania a ich publikovanie plánujeme v krátkej budúcnosti. Doterajšie výsledky boli prezentované na významných medzinárodných podujatiach a sú zhrnuté v niekoľkých príspevkoch.

1. Šajgalík P., Lojanová Š., Hnatko M., Lenčéš Z., Gall M., Chlup Z.: GB chemistry of SiC/Si_3N_4 nano/micro-composites - implications to fracture behavior. *ECerS XII, 12th Conference of the European Ceramic Society 2011*, Stockholm, Sweden, p. 517.
2. Šajgalík P.: SiC/Si_3N_4 nano/micro-composites – phase and chemical composition - their implications to the RT and HT mechanical properties. *The 7th International Conference on High-Performance Ceramics* 2011, Xiamen, China, Abstracts - part Plenary lectures, p. 4.
3. Tatarko P., Kašiarová M., Lojanová Š., Dusza J., Šajgalík P.: Characterization of Si_3N_4-SiC micro-nano composites sintered with rare-earth oxides additives. In *Preparation of Ceramic Materials: 9th International Conference* 2011, Herľany, p. 62-66.
4. Tatarko P., Kašiarová M., Dusza J., Šajgalík P.: Effect of different sintering, additives on the room temperature tribological behaviour of Si_3N_4 micro/nano composites. In *Chemické listy* **105** (2011) s491-s493.
5. Tatarko P., Lojanová Š., Chlup Z., Dusza J., Šajgalík P., Microstructure and mechanical properties of rare-earth doped Si_3N_4 and Si_3N_4/SiC ceramics, In *Advances in Science and Technology* **65** (2010) p. 78-85.

5.) Keramické nanokompozity na báze oxidu a nitridu hafničitého so zlepšenou vysokoteplotnou oxidačnou a koróznou odolnosťou *(Hafnia- and Hafnium Nitride-Based Ceramic Nanocomposites with Improved High-Temperature Oxidation and Corrosion Resistance)*

Zodpovedný riešiteľ:	Pavol Šajgalík
Trvanie projektu:	1.1.2010 / 31.12.2012
Evidenčné číslo projektu:	PPP DAAD-SAV-2010-11
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	2 - Nemecko: 2
Čerpané financie:	

Dosiahnuté výsledky:

V rámci riešenia projektu bola úspešne zvládnutý process prípravy hutných keramických materiálov pre vysokoteplotné aplikácie z prekurzorov na báze $SiOC/HfO_2$ a $SiCN/HfO_2$. Nové systémy boli úspešne charakterizované z hľadiska získanej mikroštruktúry, mechanických ako aj funkčných vlastností, chemického a fázového zloženia. Výsledky projektu sú v štádiu vyhodnocovania a ich publikovanie plánujeme v krátkej budúcnosti.

Programy: 7RP

6.) 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 Universtät Darmstadt
Počet spoluriešiteľských inštitúcií:	9 - Nemecko: 3, Francúzsko: 2, Taliansko: 2, Švédsko: 1, Turecko: 1

Čerpané financie: EU: 14816 €
Podpora medzinárodnej spolupráce z národných zdrojov: 10902 €

Dosiahnuté výsledky:
V súvislosti s riešením projektu 7. RP EU, ktorého MVTS podporný projekt je súčasťou boli v úvodnej fáze riešenia projektu pripravené materiály na báze ternárnych nitridov dopovaných európiom. Optimalizáciou procesu prípravy bol sledovaný efekt oxidačného stupňa dopujúceho prvku na luminiscenčné vlastnosti pripravených materiálov. Na základe predbežných výsledkov získaných meraním emisných spektier boli získané predbežné údaje o oblasti emitujúceho žiarenia po excitácii rôznymi zdrojmi žiarenia ako aj ich kvantových výťažkov. Súčasne prebiehala selekcia iných vhodných dopujúcich prvkov za účelom zvýšenia kvantového výťažku emitovaného žiarenia ako aj posunu vlnovej dĺžky, resp. zúženia emisného pásu. V súvislosti s optimalizáciou zloženia pripravovaných nitridových luminofórov sa v tejto fáze projektu začal výpočet elektrónovej štruktúry pomocou DFT GGA metódy.

Programy: Bilaterálne - iné

7.) Super tvrdé a tepelne odolné jemné prášky a povlaky boridov nióbu a tantalu: príprava, vlastnosti, použitie *(Superhard and heat-resistant fine powders and coatings of niobium and tantalum borides: obtaining, properties, application)*

Zodpovedný riešiteľ: Miroslav Boča
Trvanie projektu: 4.1.2010 / 31.12.2011
Evidenčné číslo projektu: APVV Sk-UA-0039-09
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 1 - Ukrajina: 1
Čerpané financie: Podpora medzinárodnej spolupráce z národných zdrojov: 1663 €

Dosiahnuté výsledky:
Bol vytvorený návrh možnej elektrochemickej syntézy jemných práškových boridov na báze Nb a Ta z tavenín a boli popísané konkrétne postupy. Zmerali sa fyzikálnomechanické a operačné charakteristiky získaných materiálov pomocou gravimetrie, rtg. a metalografických metód.

8.) Atomárne aspekty pokročilých materiálov na báze cementu *(Atomic level aspects of advanced cementitious materials)*

Zodpovedný riešiteľ: Milan Drábik
Trvanie projektu: 1.1.2008 / 31.12.2012
Evidenčné číslo projektu:
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 1 - Veľká Británia: 1
Čerpané financie:

Dosiahnuté výsledky:
Získali sa unikátne výsledky o účinku mechanochemickej predúpravy surovín na priebeh sieťovacích interakcií funkčných skupín polymérov s povrchom zŕn cementu.

Časť výsledkov bola publikovaná v:
Drábik M., Gáliková Ľ., Billík P.: The chemistry & challenge of MDF materials, 14. Osterreichische Chemitage 2011, Linz, Rakúsko

9.) Alternatívne materiály a zariadenia pre komponenty do púmp *(Alternative Werkstoffe fur 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: 3500 €

Dosiahnuté výsledky:

Pre vybrané systémy relevantné v tomto projekte boli kriticky posúdené možnosti aktualizovať poznatky o mechanochemickej predúprave MDF surovín, viď v publikácii (Drábik M., Gáliková Ľ., Billík P.: The chemistry & challenge of MDF materials, 14. Osterreichische Chemitage 2011, Linz, Rakúsko, oP-39). Nadväzne, získané výsledky boli odovzdané partnerským pracoviskám – Materials Center Leoben a Andritz GmbH Graz, vzhľadom na charakter projektu, tieto nemôžu byť obsahom verejne dostupných publikácií.

Drábik M., Balkovic S., Peteja M.: Long-termi investigation of autoclaved aerated concrete produced from fluidized fly ash. In XII ICCC International Congress on the Chemistry of Cement 2011, Madrid, Spain, p. 446.

10.) Molekulové simulácie vybraných organoílov - charakterizácia štruktúry a vlastností *(Molecular simulations of selected organoclays - characterization of structure and properties)*

Zodpovedný riešiteľ:	Eva Scholtzová
Trvanie projektu:	1.1.2011 / 31.12.2012
Evidenčné číslo projektu:	SK-AT-0020-10
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 623 €

Dosiahnuté výsledky:

V prvom roku riešenia projektu boli navrhnuté modely interkalovaného montmorilonitu. Ako interkalovaný katión bol použitý TMA^+ katión, ktorý slúži ako dôležitý prekurzor pri príprave zložitejších interkalátov. Okrem toho sa navrhli modely komplexu kaolinit-metanol. Kvantovochemickým prístupom boli skúmané interakcie v medzivrství a boli vypočítané vibračné módy, ktoré pomohli analyzovať experimentálne namerané IČ spektrá týchto modelov ílových minerálov veľmi detailne. Čiastkové výsledky boli prezentované na 63. zjazde chemikov vo Vysokých Tatrách formou postra a v súčasnosti sú výsledky spracovávané pre publikovanie v zahraničných karentovaných časopisoch.

Scholtzová E., Tunega D., Benco Ľ. and Pálková H.: DFT study of montmorillonite intercalated with TMA. In ChemZi: 63. Zjazd chemikov - Tatranské Matliare 2011, roč. 13, s. 196.

Projekty národných agentúr

Programy: VEGA

1.) Fluoridové taveniny pre vysokoteplotné aplikácie *(Fluoride melts for high temperature applications)*

Zodpovedný riešiteľ:	Miroslav Boča
Trvanie projektu:	1.1.2009 / 31.12.2011
Evidenčné číslo projektu:	2/0058/09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV

Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 9754 €

Dosiahnuté výsledky:

Zameraním projektu bolo štúdium fyzikálno-chemických a termodynamických vlastností, spektrálnych a difrakčných charakteristík fluoridových taveninových sústav uvažovaných z hľadiska chladiacich a teplotransportných systémov ako aj pre iné vysokoteplotné aplikácie. Bol nameraný fázový diagram, hustota, povrchové napätie a viskozita sústavy FLiNaK-K_2ZrF_6. Okrem toho bola študovaná aj odolnosť rôznych konštrukčných materiálov v skúmanom systéme. Spektrálne a difrakčné charakteristiky boli študované na fluoridových systémoch na báze tantalu, nióbu a hliníka.

Boča M., Moncol J., Netriová Z., Velič D., Jerigová M., Nunney T. S., Baily C. J., Kubíková B., Šimko F., Janderka P.: Variation of oxygen content in selected potassium fluorido-oxido-tantalate phases. In *Solid State Sciences* **13** (2011) 2190-2195.
Kubíková B., Macková I., Boča M.: Phase analysis and volume properties of the $(FLiNaK)_{eut}$-K_2ZrF_6 system. In *Journal of Solid State Chemistry* – zaslané

2.) Fluorescenčné hybridné materiály organických farbív interkalovaných v anorganických nosičoch s vrstevnatou štruktúrou *(Fluorescent hybrid materials based on organic dyes intercalated in layered inorganic carriers)*

Zodpovedný riešiteľ: Juraj Bujdák
Trvanie projektu: 1.1.2009 / 31.12.2012
Evidenčné číslo projektu: 2/0089/09
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: SAV: 9181 €

Dosiahnuté výsledky:

Organicky modifikované vrstevnaté kremičitanu preukázali optimálne vlastnosti ako východiskové materiály pre prípravu hybridov s fluorescenčnými farbivami. Napriek tomu, istý stupeň fotoaktivity možno dosiahnuť aj bez chemickej modifikácie organickými katiónmi. Toto sa potvrdilo pri príprave a charakterizácii systémov pre dvojstupňový rezonančný prenos fluorescenčnej energie, pri príprave hybridov na báze niektorých porfyrínových farbív tvoriacich aktívne J-agregáty a v sústavách smektitov s rôznymi typmi anorganických katiónov.

1. Bujdák J., Czímerová A., Arbeola F.L.: Two-step resonance energy transfer between dyes in layered silicate films. In *Journal of Colloid and Interface Science* **364** (2011) 497-504.
2. Čeklovský A., Takagi S., Bujdák J.: Study of spectral behaviour and optical properties of cis/trans-bis (N-menthylpyridinium-4-yl)diphenyl porphyrin adsorbed on layered silicates. In *Journal of Colloid and Interface Science* **360** (2011) 26-30.
3. Czímerová A., Jankovič Ľ., Bujdák J.: Spectral properties of Rhodamine 6G in smectite dispersions: Effect of the monovalent cations. In *Journal of Colloid and Interface Science* **357** (2011) 322-330.
4. Bujdák J., Iyi N.: Energy transfer between dye molecules at the surface of clay minerals. In *EUROCLAY 2011: European Clay Conference*, Antalya, p. 202.
5. Bujdák J.: Supramolecular systems based on organic dyes and clay minerals: interpretations of phenomena and potential applications. In *EUROCLAY 2011: European Clay Conference*, Antalya, p. 201.
6. Czímerová A., Bujdák J.: Resonance energy transfer in thin films prepared using layer-by-layer assembly. In *EUROCLAY 2011: European Clay Conference*, Antalya, p. 435
7. Czímerová A., Bujdák J.: Resonance energy transfer in thin films prepared using layer-by-layer assembly. In *ChemZi: 63. Zjazd chemikov 2011*, Tatranské Matliare, č. **13**, s. 95.

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 autoclavel 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: 3902 €

Dosiahnuté výsledky:

Overoval sa rozsah fázových premien v pórobetónoch novej generácie, so špeciálnym dôrazom na kritické posúdenie hypotézy, podľa ktorej sa pri zmene surovinového zloženia časť spojivovej C-S-H fázy a tobermoritu podobných fáz môžu premieňať na neväzbový taumazit. Taktiež sa získali unikátne výsledky o účinku mechanochemickej predúpravy na priebeh sieťovacích interakcií v MDF surovinách. Výsledky sú publikované v:

Živica V., Balkovic S., Drábik M.: Properties of metakaolin geopolymer hardened paste prepared by high-pressure compaction. In Construction and Building Materials 25 (2011) 2206-2213.

4.) Sklené a sklokeramické materiály na báze aluminátov vzácnych zemín s výnimočnými mechanickými a optickými vlastnosťami *(Glass and glass-ceramic rare-earth aluminate materials with exceptional mechanical and optical properties)*

Zodpovedný riešiteľ: Dušan Galusek
Trvanie projektu: 1.1.2009 / 31.12.2011
Evidenčné číslo projektu: 1/0603/09
Organizácia je koordinátorom projektu: nie
Koordinátor: Trenčianska Univerzita Alexandra Dubčeka
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: SAV: 7557 €

Dosiahnuté výsledky:

1. Prnová A., Lichvár P., Galusek D., Galusková D., Hnatko M.: Flame synthesis of aluminate glass microspheres. In *Glass Technology: European Journal of Glass Science and Technology A* **51** (2010) 248-252.
2. Prnová A. Domanická A., Klement R., Kraxner J., Polovka M., Pentrák M., Galusek D., Šimurka P., Kozánková J.: Er- and Nd-doped yttrium aluminosilicate glasses: Preparation and characterization. In *Optical Materials* **33** (2011) 1872-1878.
3. Prnová A., Galusek D., Hnatko M., Kozánková J., Vávra I.: Composites with eutectic microstructure by hot pressing of Al_2O_3–Y_2O_3 glass microspheres. In *Ceramics-Silikáty* **55** (2011) 208-213.
4. Domanická A., Prnová A., Ghillányová K., Klement R., Galusek D.: Fabrication and properties of yttrium aluminosilicate glasses doped with Nd and Er. In *Sklář a keramik* **61** (2011) 194-198.
5. Migát M., Sedláček J., Ghillányová K., Galusek D.: The influence of processing parameters on morphology and size distrubution of SiO_2 microspheres prepared by Stöber method. In *Sklář a keramik* **61** (2011) 199-202.
6. Hruška B., Ghillányová K., Klement R., Prnová A., Galusek D.: Preparation and properties of glasses in the system Al_2O_3–Y_2O_3–ZrO_2: A preliminary study: In *Sklář a keramik* **61** (2011) 203-207.
7. Prnová A., Klement R., Migát M., Galusek D., Ghillányová K., Polovka M.: Synthesis and spectroscopic properties of Nd – and Er-doped Al_2O_3–Y_2O_3 glass microspheres. In *Sklář a keramik* **61** (2011) 208-212.
8. Piatriková A., Prnová A., Ghillányová K., Migát M., Klement R., Galusek D.: Er^{3+}, Nd^{3+}-doped lanthanum-aluminate glasses: Preparation and properties. In *Sklář a keramik* **61** (2011) 213-216.
9. Prnová A., Galusek D., Škrátek M., Karell R., Klement R., Kraxner J.: Preparation and Characterization of Yb_2O_3 – Al_2O_3 Glass Microspheres with High Alumina Content. In *MEASUREMENT 2011: Proceedings of the 8th International Conference on Measurement*, p. 269-273.
10. Migát M., Sedláček J., Ghillányová K., Galusek D.: The size dependence of SiO_2 spheres prepared by polycondensation reactions on concentration of reactants in starting mixture. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 49-52.
11. Domanická A., Prnová A., Migát M., Klement R., Galusek D.: Fabrication and properties of aluminosilicate glasses. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 114-117.
12. Piatriková A., Prnová A., Klement R., Galusek D.: Er^{3+}, Nd^{3+}-doped lanthanum-aluminate glasses: preparation and properties. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 118-122.
13. Klement R., Prnová A., Galusek D., Ghillányová K.: Yttrium aluminate and aluminosilicate glasses doped with Nd^{3+} and Er^{3+} ions. In *Proceedings of IXth International Conference : Preparation of Ceramics Materials 2011*, Herľany, s. 176-177.

14. Prnová A., Klement R., Galusek D., Ghillányová K.: Preparation and properties of Nd- and Er-doped Al_2O_3-Y_2O_3 glasses. In *Proceedings of IXth International Conference : Preparation of Ceramics Materials* 2011, Herľany, s. 180-181.
15. Prnová A., Klement R., Galusek D.: Yttrium aluminate and low silica ytrium aluminosilicate glass hosts doped with optically active rare-earth ions: Preparation and characterization. In *New trends in coordination, bioinorganic, and applied inorganic chemistry*, Monograph series of the International conference on coordination and bioinorganic chemistry, Vol. **10** (2011) 219-226.

5.) Štruktúra a vlastnosti oxidových skiel - termodynamické modely, vibračná spektroskopia a molekulová dynamika *(Structure and properties of oxide glasses - thermodynamic models, vibrational spectroscopy and molecular dynamics)*

Zodpovedný riešiteľ:	Mária Chromčíková
Trvanie projektu:	1.1.2009 / 31.12.2011
Evidenčné číslo projektu:	1/0330/09
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Trenčianska univerzita Alexandra Dubčeka
Počet spoluriešiteľských inštitúcií:	1 - Slovensko: 1
Čerpané financie:	SAV: 7323 €

Dosiahnuté výsledky:

Kombináciou metód molekulovej dynamiky, termodynamického modelovania a Ramanovej spektroskopie sa získali významné výsledky pri interpretácii vzťahu medzi zložením, štruktúrou a vlastnosťami oxidových skiel.

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

Zodpovedný riešiteľ:	Zoltán Lenčéš
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: 12874 €

Dosiahnuté výsledky:

Boli pripravené luminofóry na báze $MgSiN_2$ a $LaSi_3N_5$ dopované európiom v koncentračnom rozsahu 1-6 mol.%. Po optimalizácii podmienok nitridácie východiskových zmesí na báze silicidov (LaSi, Mg_2Si), kremíka a Si_3N_4 a následného žíhania v pretlakovej peci v atmosfére dusíka boli pripravené luminofóry na báze $LaSi_3N_5$:Eu emitujúce zelené svetlo a na báze $MgSiN_2$:Eu emitujúce červené svetlo po excitácii UV žiarením. Najvyššiu intenzitu emitovaného žiarenia mali vzorky $MgSiN_2$ dopované 4 mol.% Eu.

Vypočítala sa aj elektrónová štruktúra a šírka zakázaného pásu $LaSi_3N_5$ dopovaného európiom klasickou DFT GGA metódou a hybridnou HSE06 metódou. Hybridnou metódou bola vypočítaná šírka zakázaného pásu 3,23 eV, hodnota blízka experimentálne stanovenej hodnote 3,5 eV.

1. Zhou Y., Yoshizawa Y., Hirao K., Lenčéš Z., Šajgalík P.: Combustion synthesis of $LaSi_3N_5$:Eu^{2+} phosphor powders. *In Journal of the European Ceramic Society* **31** (2011) 151-157.
2. Lenčéš Z., Pentráková L., Hrabalová M., Hirao K., Šajgalík P.: Decomposition of $MgSiN_2$ in nitrogen atmosphere, *In Journal of the European Ceramic Society* **31** (2011) 1473-1480.
3. Benco Ľ., Lenčéš Z., Šajgalík P., Jáné E., Velič D.: Europium-doped LaSi3N5 ternary nitride: synthesis, spectroscopy, computed electronic structure and band gaps. In *Journal of the American Ceramic Society* **94** (2011) 4345-4351.
4. Bača Ľ., Lenčéš Z., Stelzer N.: Phase, microstructure evolution and sintering of Sr-doped TiB_2 precursors. In *Journal of the European Ceramic Society* **31** (2011) 1465-1471.
5. Lenčéš Z., Benco Ľ., Šajgalík P., Jáné E., Velič D.: Europium –doped ternary silicon nitrides: Synthesis,

spectroscopy and calculated band-gaps. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 20-21.
6. Plachký T., Lenčéš Z., Riedel R., Šajgalík P.: Photoluminescent properties of Eu doped polymer derived SiAlON ceramics. In *Preparation of Ceramic Materials : 9th International Conference 2011*, Herľany, p. 160-161.
7. Lenčéš Z., Benco Ľ., Šajgalík P., E. Jáné, D. Velič: Europium-doped ternary silicon nitrides: synthesis, spectroscopy and calculated band-gaps. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics 2011 from Materials to Components*, Smolenice, Book of Abstracts and Programme p. 32.

7.) Chemické modifikácie povrchov prírodných nanomateriálov *(Chemical modifications of the natural nanomaterials surfaces)*

Zodpovedný riešiteľ:	Jana Madejová
Trvanie projektu:	1.1.2009 / 31.12.2012
Evidenčné číslo projektu:	2/0183/09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	SAV: 15867 €

Dosiahnuté výsledky:

Riešenie projektu pokračovalo podľa naplánovaných cieľov. Výsledky sú, resp. budú publikované v nasledujúcich prácach:
1. Jankovič Ľ., Madejová J., Komadel P., Jochec-Mošková D., Chodák I.: Characterization of systematically selected organo-montmorillonites for polymer nanocomposites. In *Applied Clay Science* **51** (2011) 438 - 444.
2. Madejová J., Jankovič Ľ., Pentrák M., Komadel P.: Benefits of near-infrared spectroscopy for characterization of selected organo-montmorillonites. In *Vibrational Spectroscopy* **57** (2011) 8-14.
3. Pálková H. Jankovič Ľ., Zimowska M., Madejová J.: Alterations of the surface and morphology of tetraalkyl-ammonium modified montmorillonites upon acid treatment. In *Journal of Colloid and Interface Science* **363** (2011) 213-222.
4. Pentrák M., Czímerová A., Madejová J., Komadel P.: Changes in layer charge of clay minerals upon acid treatment as obtained from their interactions with methylene blue. In *Applied Clay Science*, doi:10.1016/j.clay.2011.10.012
5. Pentrák M., Madejová J., Andrejkovičová S., Uhlík P., Komadel P.: Stability of kaolin sand from Vyšný Petrovec deposit (south Slovakia) in acid environment. *Geologica Carpathica*, zaslané
6. Brtáňová A., Melichová Z., Komadel P.: Removal of Cu^{2+} from aqueous solutions by Slovak bentonites. In *Ceramics-Silikáty*, v tlači
7. Madejová J., Pálková H., Jankovič Ľ.: Degradation of surfactant-modified montmorillonites in HCl. Zaslané do *Materials Chemistry and Physics*.

8.) Od detailného poznania elektrónovej štruktúry molekúl k návrhu nových materiálov *(From detailed knowledge of the electron structure of molecules to the design of new materials)*

Zodpovedný riešiteľ:	Oľga Malkin
Trvanie projektu:	1.1.2009 / 31.12.2012
Evidenčné číslo projektu:	2/0079/09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	1 - Slovensko: 1
Čerpané financie:	SAV: 14987 €

Dosiahnuté výsledky:

1. Kahn K., Kirtman B., Hagen A., Noga J.: Communication: Convergence of anharmonic infrared intensities of hydrogen fluoride in traditional and explicitly correlated coupled cluster calculations. In *Journal of Chemical Physics* **135** (2011) p. 131103-1-131103-4.
2. Kedžuch S., Demel O., Pittner J., Ten-no S., Noga J.: Multireference F12 coupled cluster theory: The Brillouin-Wigner approach with single and double excitations. In *Chemical Physics Letters* **511** (2011) 418-423.

3. ., Noga J., Urban M.: Parallelized implementation of the CCSD(T) method in MOLCAS using optimized virtual orbitals space and Cholesky decomposed two-electron integrals. In *Collection of Czechoslovak Chemical Communications* **76** (2011) 713-742.
4. Malkina O.L., Komorovský S., Visscher L., Malkin V.G.: Note: Counterintuitive gauge-dependence of nuclear magnetic resonance shieldings for rare-gas dimers: Does a natural gauge-origin for spherical atoms exist? In *Journal of Chemical Physics* **134** (2011) p. 086101-1-086101-2.
5. Malkin E., Repiský M., Komorovský S., Mach P., Malkina O.L., Malkin V.G.: Effects of finite size nuclei in relativistic four-component calculations of hyperfine structure. In *Journal of Chemical Physics* **134** (2011) p. 044111-1-044111-8.

9.) Skelné a keramické materiály s priestorovo usporiadanou štruktúrou *(Glasses and ceramics with 3D ordered structure.)*

Zodpovedný riešiteľ:	Jaroslav Sedláček
Trvanie projektu:	1.1.2010 / 31.12.2012
Evidenčné číslo projektu:	2/0076/10
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	2 - Slovensko: 2
Čerpané financie:	SAV: 4337 €

Dosiahnuté výsledky:

Sledoval sa vplyv parametrov prípravy guľovitých častíc SiO_2 pomocou polykondenzačných reakcií organokovového prekurzoru s ohľadom najmä na veľkosť pripravených častíc a jej distribučné rozdelenie. Pripravené častice boli charakterizované aj z pohľadu morfológie pomocou elektrónovej mikroskopie. Na pripravených časticiach boli skúmaneé možnosti ich využitia pri príprave vrstiev ako aj priestorových materiálov rôznymi postupmi.

1. Migát M., Sedláček J., Ghillányová K., Galusek D.: The influence of processing parameters on morphology and size distrubution of SiO_2 microspheres prepared by Stöber method. In *Sklář a keramik* **61** (2011) 199-202.
2. Migát M., Sedláček J., Ghillányová K., Galusek D., The size dependence od SiO_2 spheres prepared by polycondensation reactions on concentration of reactants in starting mixture. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 49-52.

10.) Štúdium štruktúry a dynamiky vodíkových väzieb v tuhých látkach difrakčnými metódami, metódami kvantovej chémie a neelastickou neutrónovou spektroskopiou /INS/ *(Structure and dynamics of hydrogen bonds in solids by diffraction methods, quantum chemistry and inelastic neutron spectroscopy (INS))*

Zodpovedný riešiteľ:	Ľubomír Smrčok
Trvanie projektu:	1.1.2009 / 31.12.2011
Evidenčné číslo projektu:	2/0150/09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	SAV: 2966 €

Dosiahnuté výsledky:

Metódou molekulovej dynamiky v tuhej fáze boli interpretované vodíkové vibračné spektrá protónového vodiča (dihydrogénfosforečnanu fenylamónia) a prírodného minerálu, trioktaédrického flogopitu. Spektrá boli získané metódou neelastického rozptylu neutrónov. V prvom prípade sme analyzovali dynamiky kooperujúcich funkčných skupín a ich vplyv na tvorbu a dynamiku vodíkový väzieb. V prípade flogopitu sme objasnili dynamiku vodíkového atómu vo 2:1 vrstve silikátu v prípade obsadenia všetkých troch pozícií oktaédrických katiónov.

11.) Výskum keramických kompozitných materiálov pripravených z polymérnych prekurzorov 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: 15680 €

Dosiahnuté výsledky:

Boli ocharakterizované mechanické vlastnosti a oteruvzdornosť referenčných materiálov na báze Si_3N_4/SiC s konvenčnými spekacími prísadami (Al_2O_3, La_2O_3, Yb_2O_3 a Lu_2O_3). Bola zvládnutá príprava materiálu na báze Si_3N_4 s nekonvenčnou prísadou spekania SiAlOC, pripraveného z polymérnych prekurzorov. Materiál mal porovnateľné mechanické vlastnosti s referenčným materiálom, ale lepšiu oxidačnú odolnosť a odolnosť voči vysokoteplotnému tečeniu pri 1300 °C.

V spolupráci s TU Darmstadt, Nemecko boli pripravené prekurzori SiHfOC, SiZrOC a SiLuOC. Po optimalizácii podmienok zhutňovania (teplota, tlak, zloženie plynnej atmosféry v peci) sa podarilo pripraviť hutné materiály z polymérnych prekurzorov v teplotnom intervale 1550 – 1650 °C. Tieto materiály budú použité na prípravu hutných kompozitov na báze Si_3N_4.

V spolupráci s University of Padova, Taliansko boli vyvinuté prísady na báze polymérnych prekurzorov a nanoprášok obsahujúcich Si-Al-O-C. Zloženie prekurzorov a ich tepelné spracovanie bolo zvolené s cieľom pripraviť kompozit s matricou Si_3N_4 spojenou fázami β-SiAlONu a O′-SiAlONu. Oba materiály boli úspešne zhutnené žiarovým lisovaním pri teplote 1700 °C, tzn. o 50 °C nižšie, ako v prípade materiálov s klasickými prísadami spekania.

Doterajšie výsledky sú zhrnuté v prácach:

1. Šajgalík P., Galusková D., Hnatko M., Galusek D.: Interactions of Si_3N_4-based ceramics in water environment under subcritical conditions. In *Proceedings of the 35th International Conference on Advanced Ceramics and Composites* 2011, Daytona Beach, Florida.
2. Frajkorová F., Hnatko M., Lenčéš Z., Šajgalík P.: Additive system Y_2O_3-SiO_2-Ti-NbC for preparation of electrically conductive SiC. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 184.
3. Ghillányová K., Hnatko M., Šajgalík P.: Sol-Gel derived hydroxyapatite infiltration for enhancing the bioactivity of new silicon nitride – based biomaterial. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 172-173.
4. Hnatko M., Šajgalík P., Lofaj F., Vojtaššák J.: Porous silicon nitride ceramics for bioapplications. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice,. Book of Abstracts and Programme p. 83.
5. Galusek D., Ghillányová K., Sedláček J.: The influence of additives on two-stage sintering of submicrometre alumina. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics 2011 from Materials to Components*, Smolenice, Book of Abstracts and Programme p. 37.
6. Bača Ľ., Vitkovič M., Jogl C., Neubauer E., Merstallinger A., Šajgalík P.: Microstructure evolution and tribological properties of TiB_2-based cermets. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics 2011 from Materials to Components,* Smolenice, Book of Abstracts and Programme p. 63.

12.) 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: 7803 €

Dosiahnuté výsledky:
Uskutočnila sa fyzikálno-chemická analýza nízko topiacich sa fluoridových systémov KF-AlF_3 s prídavkom zložiek Al_2O_3 a $AlPO_4$. Analyzovali sa oba trojzložkové systémy pomocou metód merania termickej analýzy a hustoty príslušných systémov. Namerali sa teploty primárnych a sekundárnych kryštalizácií oboch systémov pri rôznych "kryolitových" pomeroch (rôzny pomer KF ku AlF_3 v systéme, označenie - CR), a to pri CR = 3.0, 2.5, 2.0 a 1.5. Z nameraných údajov sa zostrojili príslušné fázové diagramy. Namerala sa aj hustota oboch systémov pri príslušných uvedených kryolitových pomeroch. Popri uvedených meraniach sa vykonala aj chemická analýza spomenutých systémov pomocou rôznych analytických metód. Cieľom bolo identifikovať možné produkty reakcií, prebiehajúcich v meraných systémoch a určiť možný rozdiel v správaní sa systémov s rozdielnym obsahom AlF_3 v systéme.

Programy: APVV

13.) Moderné využitie fluoridových tavenín *(Modern application of fluoride molten salts)*

Zodpovedný riešiteľ:	Miroslav Boča
Trvanie projektu:	1.9.2009 / 31.8.2012
Evidenčné číslo projektu:	LPP-0345-09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 16600 €

Dosiahnuté výsledky:
Predmetom štúdia bol taveninový systém na báze zirkónia, ako potenciálnej sústavy pre jej využitie v jadrovej energetike. Boli vyhodnotené výsledky z merania fázových rovnováh sústavy $(FLiNaK)_{eut}$-K_2ZrF_6, ako aj objemových a transportných vlastností študovaného system, akými sú hustota, molárne objemy, viskozita a povrchové napätie. Pre potenciálne využitie študovanej sústavy sa realizovali korózne testy odolnosti vybraných konštrukčných materiálov s obsahom zirkóniav roztavenom systéme $(FLiNaK)_{eut}$-K_2ZrF_6.

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: 20750 €

Dosiahnuté výsledky:
Sledovala sa korózna odolnosť zirkóniových materiálov v koróznom prostredí eutektickej taveniny $(LiF\text{-}NaF\text{-}KF)_{eut}$ s prídavkom K_2ZrF_6 pri teplotách 600 °C a 900 °C v inertnej atmosfére argónu. Korózna odolnosť sa určovala pomocou hmotnostného úbytku na materiály po koróznom teste. Na základe spracovania vedeckých článkov a patentov sa navrhla príprava fluorozirkoničitanu sodného. Syntézou z vodných roztokov sa pripravila zlúčenina $Na_7Zr_6F_{31}$. Daná zlúčenina sa identifikovala simultánnou termickou analýzou, RTG práškovou štruktúrnou analýzou a RTG fotoelektrónovou spektroskopiou.

Konferencie:
1. Barborík P., Boča M., Šimko F.: Štúdium korózie vo fluorozirkoničitých taveninách. In *Jaderná energetika, transmutační a vodíkové technologie v pracích mladé generace*: 10. Mikulášské setkání Mladé generace ČNS, Brno, Sborník referátů ze semináře p. 87-90.
2. Barborík P., Boča M.: A study of the corrosion of the zirconium alloys. In *ENYGF 2011: European Nuclear Young Generation Forum*, Praha, ČNS, p. 48.
3. Barborík P., Boča M.: Odolnosť zirkóniových zliatin v roztavených fluoridových soliach. In *ChemZi: ChemZi: 63. Zjazd chemikov 2011*, Tatranské Matliare, č. **13**, s. 86.

15.) Anorganické fluoridové taveniny - komplexné štúdium spektrálnych, difrakčných, fyzikálnochemických, 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 / 30.4.2014
Evidenčné číslo projektu:	APVV-0460-10
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 55557 €

Dosiahnuté výsledky:

V prvom roku riešenia projektu sa vykonali merania vybraných fyzikálno-chemických vlastností (viskozita a objemové vlastnosti) vysokoteplotného taveninového systému na báze FLiNaK-K_2ZrF_6. V rámci meraní fyzikálno-chemických vlastností sa skonštruovala cela na báze pyrolitického nitridu bóru pre vysokoteplotné meranie elektrickej vodivosti roztavených systémov a zmerala elektrická vodivosť systému na báze Na_3AlF_6 – SiO_2. Východisková tavenina FLiNaK sa použila aj ako základné korózne médium pri testoch vybraných konštrukčných materiálov na báze Ni (INCALLOY 800 H/HT, HASTELLOY) a Zr (ZRYLO).

16.) Keramické kompozity s perkolujúcimi fázami pripravené infiltráciou organokovového prekurzoru *(Ceramic composites with percolated phases prepared by infiltration with organometallic precursors)*

Zodpovedný riešiteľ:	Dušan Galusek
Trvanie projektu:	1.9.2009 / 31.8.2012
Evidenčné číslo projektu:	LPP-0297-09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 21102 €

Dosiahnuté výsledky:

Boli skúmané možnosti prípravy kompozitných materiálov v systéme Al_2O_3-SiC, ktoré sa vyznačujú perkolujúcimi fázami jednoltivých zložiek. Príprava týchto materiálov spočívala v infiltrácii pórovitého matrixu Al_2O_3 polymérnym prekurzorom pri zvýšenom tlaku. Na pripravených vzorkách bol optimalizovaný proces zhutnenia a sledované mechanické vlastnosti pri izbových a vysokých teplotách. Pre porovnanie výsledkov vlastností boli pripravené kompozitné materiály konvenčným spôsobom z keramických práškov.

1. Galusek D., Klement R., Sedláček J., Balog M., Fasel, Zhang J., Crimp M.A., Riedel R.: Al_2O_3-SiC composites prepared by infiltration of pre-sintered alumina with a poly(allyl)carbosilane. In *Journal of the European Ceramic Society* **31** (2011) 111-119.
2. Švančárek P., Lendvayová S., Galusek D., Hnatko M., Vávra I., Wang X.: Abrasive wear resistance of SiO_2-doped polycrystalline alumina. In *Wear: an international journal on the science and technology of friction, lubrication and wear* **271** (2011) 760-769.
3. Sedláček J., Galusek D., Riedel R., Hoffmann M.J.: Sinter-HIP of polymer-derived Al_2O_3–SiC composites with high SiC contents. In *Materials Letters* **65** (2011) 2462-2465.
4. Parchovianský M., Sedláček J., Švančárek P., Galusek D.: Microstructure and mechanical properties of Al_2O_3/SiC nanocomposites. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 13-16.
5. Sedláček J., Galusek D., Hoffmann M.J., Riedel R.: Preparation of dense polymer derived Al_2O_3-SiC ceramic composites. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 162-163.

6. Galusek D., Švančárek P., Hnatko M.: The influence of silica on abrasive wear resistance of polycrystalline alumina. In *ECerS XII. Proceedings of the 12th Conference of the European Ceramic Society 2011*, Stockholm, CD ROM.
7. Sedláček J., Galusek D., Riedel R., Hoffmann M.J.: Preparation of fully dense polymer-derived Al_2O_3-SiC composites by using sinter-HIP technique. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components*, Book of Abstracts and Programme, Smolenice, p. 97.

17.) Sklené a sklokeramické materiály na báze aluminátov vzácnych zemín *(Glasses and glass ceramics based on rare earth aluminates)*

Zodpovedný riešiteľ:	Dušan Galusek
Trvanie projektu:	1.9.2009 / 31.8.2012
Evidenčné číslo projektu:	LPP-0133-09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 16281 €

Dosiahnuté výsledky:

1. Prnová A., Lichvár P., Galusek D., Galusková D., Hnatko M.: Flame synthesis of aluminate glass microspheres. In *Glass Technology: European Journal of Glass Science and Technology A* **51** (2010) 248-252.
2. Prnová A. Domanická A., Klement R., Kraxner J., Polovka M., Pentrák M., Galusek D., Šimurka P., Kozánková J.: Er- and Nd-doped yttrium aluminosilicate glasses: Preparation and characterization. In *Optical Materials* **33** (2011) 1872-1878.
3. Prnová A., Galusek D., Hnatko M., Kozánková J., Vávra I.: Composites with eutectic microstructure by hot pressing of Al_2O_3–Y_2O_3 glass microspheres. In *Ceramics-Silikáty* **55** (2011) 208-213.
4. Domanická A., Prnová A., Ghillányová K., Klement R., Galusek D.: Fabrication and properties of yttrium aluminosilicate glasses doped with Nd and Er. In *Sklář a keramik* **61** (2011) 194-198.
5. Migát M., Sedláček J., Ghillányová K., Galusek D.: The influence of processing parameters on morphology and size distrubution of SiO_2 microspheres prepared by Stöber method. In *Sklář a keramik* **61** (2011) 199-202.
6. Hruška B., Ghillányová K., Klement R., Prnová A., Galusek D.: Preparation and properties of glasses in the system Al_2O_3–Y_2O_3–ZrO_2: A preliminary study, In *Sklář a keramik* **61** (2011) 203-207.
7. Prnová A., Klement R., Migát M., Galusek D., Ghillányová K., Polovka M.: Synthesis and spectroscopic properties of Nd – and Er-doped Al_2O_3–Y_2O_3 glass microspheres. In *Sklář a keramik* **61** (2011) 208-212.
8. Piatriková A., Prnová A., Ghillányová K., Migát M., Klement R., Galusek D.: Er^{3+}, Nd^{3+}-doped lanthanum-aluminate glasses: Preparation and properties. In *Sklář a keramik* **61** (2011) 213-216.
9. Prnová A., Galusek D., Škrátek M., Karell R., Klement R., Kraxner J.: Preparation and Characterization of Yb_2O_3 – Al_2O_3 Glass Microspheres with High Alumina Content. In *MEASUREMENT 2011: Proceedings of the 8th International Conference on Measurement*, p. 269-273.
10. Migát M., Sedláček J., Ghillányová K., Galusek D.: The size dependence of SiO_2 spheres prepared by polycondensation reactions on concentration of reactants in starting mixture. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 49-52.
11. Domanická A., Prnová A., Migát M., Klement R., Galusek D.: Fabrication and properties of aluminosilicate glasses, In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 114-117.
12. Piatriková A., Prnová A., Klement R., Galusek D.: Er^{3+}, Nd^{3+}-doped lanthanum-aluminate glasses: preparation and properties. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 118-122.
13. Klement R., Prnová A., Galusek D., Ghillányová K.: Yttrium aluminate and aluminosilicate glasses doped with Nd^{3+} and Er^{3+} ions. In *Proceedings of IXth International Conference : Preparation of Ceramics Materials 2011*, Herľany, s. 176-177.
14. Prnová A., Klement R., Galusek D., Ghillányová K.: Preparation and properties of Nd- and Er-doped Al_2O_3-Y_2O_3 glasses. In P*roceedings of IXth International Conference: Preparation of Ceramics Materials 2011*, Herľany, s. 180-181.
15. Prnová A., Klement R., Galusek D.: Yttrium aluminate and low silica ytrium aluminosilicate glass hosts doped with optically active rare-earth ions: Preparation and characterization. In *New trends in coordination, bioinorganic, and applied inorganic chemistry*, Monograph series of the International conference on coordination and bioinorganic chemistry **10** (2011) 219-226.

18.) 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: 23148 €

Dosiahnuté výsledky:

V školskom roku 2010/2011 bolo zapojených 7940 študentov základných a stredných škôl. V júni boli zorganizované 3 odborné sústredenia pre najlepších riešiteľov, ktorých sa zúčastnilo 110 študentov. Bolo vydaných 9 zborníkov súťažných úloh a učebný text pre odborné sústredenie. V tomto školskom roku 2011/2012 je do súťaže zapojených 5533 študentov.

19.) Výskumno-vzdelávacie centrum excelentnosti pre výskum pevnej fázy so zameraním na nanomateriály, environmentálnu mineralógiu a materiálovú technológiu *(Research and education centre of excellence for solid phase research focused on nanomaterials, environmental mineralogy and material science)*

Zodpovedný riešiteľ:	Peter Komadel
Trvanie projektu:	1.7.2008 / 31.12.2011
Evidenčné číslo projektu:	VVCE-0033-07
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Prírodovedecká fakulta UK Bratislava
Počet spoluriešiteľských inštitúcií:	2 - Slovensko: 2
Čerpané financie:	APVV: 13444 €

Dosiahnuté výsledky:

Riešenie projektu pokračovalo podľa plánu projektu, získali sa nové informácie o materiáloch významných pre environmentálnu mineralógiu a materiálovú technológiu, najmä na rtg. difraktometri Bruker D8 Advance na PRÍF UK a na FTIR spektrometri Nicolet 6700 na ÚACH SAV, ktoré sa zakúpili v minulosti z prostriedkov tohto projektu.

1. Madejová J., Balan E., Petit S., Application of vibrational spectroscopy to the characterization of phyllosilicates and other industrial minerals. In *Advances in the characterization of Industrial Minerals: EMU Notes in Mineralogy*, 2011, vol. 9, ch. 6, p. 171-226.
2. Pálková H., Jankovič Ľ., Zimowska M., Madejová J.: Alterations of the surface and morphology of tetraalkylammonium modified montmorillonites upon acid treatment. In *Journal of Colloid and Interface Science* **363** (2011) 213-222.
3. Bačík P., Ozdín D., Miglierini M., Kardošová P., Pentrák M., Haloda J.: Crystallochemical effects of heat treatment on Fe-dominant tourmalines from Dolní Bory (Czech Republic) and Vlachovo (Slovakia). In *Physic and Chemistry of Minerals* **38** (2011) 599-611.
4. Pentrák M., Madejová J., Andrejkovičová S., Uhlík P., Komadel P.: Stability of kaolin sand from Vyšný Petrovec deposit (south Slovakia) in acid environment. *Geologica Carpathica* - zaslané
5. Brtáňová A., Melichová Z., Komadel P.: Removal of Cu^{2+} from aqueous solutions by Slovak bentonites. *Ceramics-Silikáty* – zaslané

20.) Príprava a vlastnosti montmorillonitov modifikovaných organickými látkami a ich aplikácie v íl-polymérnych nanokompozitoch *(Preparation and properties of montmorillonites modified with organic substances and their applications in clay-polymer nanocomposites)*

Zodpovedný riešiteľ:	Peter Komadel
Trvanie projektu:	1.9.2009 / 28.12.2011

Evidenčné číslo projektu: LPP-0372-09
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: APVV: 0 €

Dosiahnuté výsledky:

Riešenie projektu bolo v roku 2011 prerušené pre zahraničný pobyt riešiteľky RNDr. J. Hrachovej, PhD., a na riešenie projektu neboli poskytnuté nijaké finančné prostriedky. 28. 12. 2011 bolo riešenie predčasne ukončené pre rozhodnutie riešiteľky zatiaľ sa nevrátiť do SR. Boli napísané dve publikácie:

1. Hrachová J., Komadel P., Janigová I., Šlouf M., Chodák I.: Properties of rubber filled with montmorillonite with various surface modifications. *Polymers Advanced Technologies*, prijaté.
2. Hrachová J., Komadel P., Jochec-Mošková D., Janigová I., Šlouf M., Chodák I.: Properties of organo-clay/natural rubber nanocomposites. *Journal of Applied Polymer Science,* zaslané.

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

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: 30500 €

Dosiahnuté výsledky:

Na prvé experimenty sa vybrala Na-forma bentonitu Jelšový Potok, pripravila a charakterizovala sa jej frakcia <2 μm a z amóniových surfaktantov s rôznym počtom a dĺžkou alifatických reťazcov sa pripravili organomontmorillonity a určili sa niektoré ich dôležité vlastnosti. Použili sa na testy ako plnivá v prírodnom kaučuku. Zistilo sa, že malé organokatióny majú iba malý vplyv na mechanické vlatnosti polymérnych kompozitov, ktoré sa zlepšujú pri použití organoílov s väčšou vzdialenosťou vrstiev. Pri porovnaní organokatiónov s rovnalým počtom atómov uhlíka v organických reťazcoch sa dosiahli lepšie výsledky pre katióny s viacerými kratšími reťazcami. Jedna práca bola odoslaná do tlače.

Hrachová J., Komadel P., Jochec-Mošková D., Janigová I., Šlouf M., Chodák I.: Properties of organo-clay/natural rubber nanocomposites. Journal of Applied Polymer Science, zaslané.

22.) Magnetoativita, elektroaktivita a fotoaktivita koordinačných zlúčenín *(Magnetoactivity, electroactivity and photoactivity of coordination compounds)*

Zodpovedný riešiteľ: Oľga Malkin
Trvanie projektu: 1.7.2008 / 30.6.2011
Evidenčné číslo projektu: VVCE-0004-07
Organizácia je koordinátorom projektu: nie
Koordinátor: Fakulta chemickej a potravinárskej technológie STU
Počet spoluriešiteľských inštitúcií: 2 - Slovensko: 2
Čerpané financie: APVV: 16597 €

Dosiahnuté výsledky:

Dvojkomponentné nekolineárne DFT metódy implementované do kvantovochemického balíku ReSpect boli použité na výpočty g-tenzorov skupiny komplexov prechodných kovov, ako V, Cr, Mo, W, Tc a Re. Originálny prístup so škálovacím faktorom pre SO operátor povolil odhadnúť príspevky SO efektov vyšších poriadkov a ukázal prečo štandartné metódy založené na poruchovej teórie nemôžu byt použité na výpočty g-tenzorov týchto komplexov. [Theor. Chem. Acc. 129 (2011) 715-725]

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

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: 20750 €

Dosiahnuté výsledky:

Boli vyvinuté nove originálne prístupy pre interpretáciu jadrovej spin-spinovej interakcie. Použitím týchto prístupov bola vysvetlená korelácia medzi fosfor-fosfor spin-spinovymi interakciami "cez priestor" a prekryvom elektronových hustôt fosforových voľných elektronových párov. [Phys. Chem. Chem. Phys. 13 (2011) 16015]

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)*

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: 29837 €

Dosiahnuté výsledky:

Efektivita implementácie metódy mDKS-RMB – základnej SCF procedúry a spriahnutých-poruchových výpočtov NMR tenzorov bola značne vylepšená. To umožnilo nám a iným používateľom ReSpect kódu posunúť sa od kalibračných výpočtov malých systémov k aplikáciám nášho programu na reálne chemicky zaujímavé systémy.

25.) Multireferenčná teória spriahnutých klastrov v R12 priblížení *(Multireference explicitly correlated coupled cluster theory within the R12)*

Zodpovedný riešiteľ:	Jozef Noga
Trvanie projektu:	1.9.2009 / 31.8.2012
Evidenčné číslo projektu:	LPP-0343-09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 16600 €

Dosiahnuté výsledky:

Kompletizácia explicitne korelovanej multireferenčnej Brillouin-Wigner metódy na úrovni spriahnutých klastrov (CCSD) a kompletizácia základnej implementácie explicitne korelovanej multireferenčnej state-specific Mukherjee metódy (Mk-CCSD(F12)).

1. Kedžuch S., Demel O., Pittner J. Ten-no S., Noga J.: Multireference F12 coupled cluster theory: The Brillouin-Wigner approach with single and double excitations. In *Chemical Physics Letters* **511** (2011) 418-423.
2. Demel O., Kedžuch S., Šváňa M., Pittner J., Ten-no S., Noga J.: Explicitly correlated Mukherjee's state specific coupled cluster method: Development and pilot applications. *Phys. Chem. Chem. Phys*. – prijaté do tlače

26.) Luminiscenčné vlastnosti oxynitridov a nitridov kremíka pripravených z organokovových prekurzorov *(Luminescence of silicon oxynitrides and nitrides prepared via organometallic precursors)*

Zodpovedný riešiteľ:	Pavol Šajgalík
Trvanie projektu:	1.9.2009 / 31.8.2012
Evidenčné číslo projektu:	LPP-0394_09
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 15959 €

Dosiahnuté výsledky:

Boli študované systémy luminoforov, systém s označením SNEu (zmes Si_3N_4, SiOC a Eu_2O_3) a systém na báze ternárnych nitridov ($MgSiN_2$ a $LaSi_3N_5$ dopovaných európiom). Príprava systému SNEu bola založená na žíhaní zmesi práškov Si_3N_4, SiOC a Eu_2O_3, alternatívnou metódou bola modifikácia polymérneho prekurzoru acetátom europia (SiEuOC). Táto metóda je výhodná z hľadiska homogenity práškov a očakávame zlepšenie luminiscenčných vlastností. V prípade druhého systému (ternárne nitridy), boli pomocou počítačovej simulácie vypočítané optimálne obsahy dopantu Eu a to v rozsahu 1-6 mol.%. Následné experimenty ukázali, že zásadným faktorom pre výsledné luminiscenčné vlastnosti je valenčný stav Eu katiónov. Pre katióny Eu^{2+} je typický požadovaný spojitý emisný pás v oblasti 500-620 nm, oproti tomu prítomnosť Eu^{3+} iónov v materiáli má za následok nežiaduce diskrétne (pásové) emisie.

Doterajšie výsledky sú zhrnuté v prácach:

1. Plachký T., Lenčéš Z., Riedel R., Šajgalík P.: Photoluminescent properties of Eu doped polymer derived SiAlON ceramics. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, 160-161.
2. Šajgalík P., Lenčéš Z., Plachký T., Velič D., Zhou Y., Hirao K.: Silicon Nitride/Oxynitride-Based Phosphors – Synthesis and Characterization. In *3rd International Symposium on Advanced Ceramics and Technology for Sustainable Energy Applications 2011,* Kenting, Taiwan, Program and Abstracts pp 38-39.
3. Lenčéš Z., Benco Ľ., Šajgalík P., Jáné E., Velič D.: Europium-doped ternary silicon nitrides: synthesis, spectroscopy and calculated band-gaps. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components*, Smolenice, Book of Abstracts and Programme p. 32.

27.) 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: 45662 €

Dosiahnuté výsledky:

V rámci prvej etapy projektu sa podarilo úspešne zvládnuť prípravu pórovitej Si_3N_4 matrice a prípravu bioaktívnej zložky vo forme hydroxyapatitu metódou sól-gel. Oba materiály boli charakterizované z hľadiska mechanických vlastností, chemického a fázového zloženia. Na perspektívnych materiáloch boli realizované biologické testy s cieľom overiť vhodnosť (čistota, prítomnosť nežiaducich prvkov, ktoré by mohli spôsobovať toxicitu) použitých východiskových materiálov pri príprave vzoriek.

1. Hnatko M., Šajgalík P., Lofaj F., Vojtaššák J.: Porous silicon nitride ceramics for bioapplications. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components 2011,* Book of Abstracts and Programme, Smolenice, p. 83.
2. Ghillányová K., Hnatko M., Šajgalík P.: Sol-Gel derived hydroxyapatite infiltration for enhancing the bioactivity of new silicon nitride – based biomaterial. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 172-173.
3. Kašiarová M., Tatarko P., Dusza J., Hnatko M.: Oxidation resistance of Si_3N_4-based composites. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 67-70.
4. Tatarko P., Kašiarová M., Lojanová Š., Dusza J., Šajgalík P.: Characterization of Si_3N_4-SiC micro-nano

composites sintered with rare-earth oxides additives. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 62-66.
5. Hnatko M., Šajgalík P., Lofaj F., Vojtaššák J.: Processing and properties of porous Si_3N_4 ceramics for bioapplications. In *Preparation of Ceramic Materials: 9th International Conference 2011*, Herľany, p. 170-171.
6. Kašiarová M., Tatarko P., Hnatko M., Dusza J.: Oxidation characteristics of Si_3N_4 based ceramics. In *Advanced Materials and Technologies: International Workshop* 2011, Budapest.

Programy: Štrukturálne fondy EÚ Výskum a vývoj

28.) Centrum pre materiály, vrstvy a systémy pre aplikácie a chemické procesy v extrémnych podmienkach *(Centre for Materials, Layers and Systems for the Applications and Chemical Processes in the Extreme Environments)*

Zodpovedný riešiteľ:	Miroslav Boča
Trvanie projektu:	14.5.2009 / 30.4.2011
Evidenčné číslo projektu:	ITMS kód: 26240120007
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	3 - Slovensko: 3
Čerpané financie:	MŠ: 46189 €

Dosiahnuté výsledky:

V zmysle zámeru projektu boli obstarané špičkové zariadenia potrebné na zvýšenie kvality odborných výstupov. Tieto prístroje boli aj nainštalované a uvedené do prevádzky a v súčasnosti sú k dispozícii pre využitie aj v širšej vedeckej komunite.

Konferencie:

Barborík P., Boča M., Šimko F.: Štúdium korózie vo fluorozirkoničitých taveninách. In *Jaderná energetika, transmutační a vodíkové technologie v pracích mladé generace*: *10. Mikulášské setkání Mladé generace ČNS,* Brno, Sborník referátů ze semináře p. 87-90.

29.) Centrum pre materiály, vrstvy a systémy pre aplikácie a chemické procesy v extrémnych podmienkach - Etapa II *(Centre for Materials, Layers and Systems for the Applications and Chemical Processes in the Extreme Environments - Stage II)*

Zodpovedný riešiteľ:	Miroslav Boča
Trvanie projektu:	1.4.2010 / 31.3.2012
Evidenčné číslo projektu:	ITMS kód: 26240120021
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	3 - Slovensko: 3
Čerpané financie:	MŠ: 1101964 €

Dosiahnuté výsledky:

V zmysle zámeru projektu boli obstarané špičkové zariadenia potrebné na zvýšenie kvality odborných výstupov. Tieto prístroje boli aj nainštalované a uvedené do prevádzky a v súčasnosti sú k dispozícii pre využitie aj v širšej vedeckej komunite. Výsledkom používania prístrojov sú aj vedecké výstupy.

1. Pálková H., Jankovič Ľ., Zimowska M., Madejová J.: Dissolution of the surfactants-modified montmorillonite in HCl – stability studies. In EUROCLAY 2011: European Clay Conference, Antalya, p 348.
2. Boča M., Kubíková B., Šimko F., Gembický M., Moncoľ J.: Different phases of fluorotantales. In 9th International Symposium on Molten Salts Chemistry and Technology 2011, Trondheim, Norway, Abstracts
3. Kubíková B., Macková I., Pavlík V., Boča M.: Physico-chemicial analysis of molten $(FliNaK)_{eut}$-K_2ZrF_6 system. In 9th International Symposium on Molten Salts Chemistry and Technology 2011, Trondheim, Norway, Abstracts
4. Šimko F., Pritula O., Smrčok L., Rakhmatullin A., Bessada C.: The study of the system Na_3AlF_6-FeF_3, In 9th International Symposium on Molten Salts Chemistry and Technology 2011, Trondheim, Norway, Abstracts
5. Barborík P., Boča M.: A study of the corrosion of the zirconium alloys. In *ENYGF 2011: European Nuclear Young Generation Forum 2011*, Praha, p. 48.

6. Plachký T., Lenčéš Z., Riedel R., Šajgalík P.: Photoluminescent properties of Eu doped polymer derived SiAlON ceramics. In Preparation of Ceramic Materials: 9th International Conference 2011, Herľany, p. 160-161.
7. Sedláček J., Galusek D., Hoffmann M. J., Riedel R.: Preparation of dense polymer derived Al_2O_3-SiC ceramic composites. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011,* Herľany, s. 162-163.
8. Hnatko M., Šajgalík P., Lofaj F., Vojtaššák J.: Processing and properties of porous Si_3N_4 ceramics for bioapplications. In *Preparation of Ceramic Materials: 9th International Conference 2011,* Herľany, p. 170-171.
9. Ghillányová K., Hnatko M., Šajgalík P.: Sol-gel derived hydroxyapatite infiltration for enhancing the bioactivity of a new silicon nitride-based biomaterial. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011,* Herľany, p. 172-173.
10. Frajkorová F., Hnatko M., Lenčéš Z., Šajgalík P.: Additive system Y2O3-SiO2-Ti-NbC for preparation of electrically conductive SiC. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011,* Herľany, p. 184.
11. Tatarko P., Dusza J., Šajgalík P.: Tribological characteristics of Si_3N_4-SiC micro/nano composites. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 48.
12. Bača Ľ., Vitkovič M., Jogl Ch., Neubauer E., Merstallinger A., Šajgalík P.: Microstructure evolution and tribological properties of TiB_2-based cermets. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 63
13. Hnatko M., Šajgalík P., Lofaj F., Vojtaššák J.: Porous silicon nitride ceramics for bioapplications. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 83
14. Ghillányová K., Hnatko M., Šajgalík P.: Sol-gel derived hydroxyapatite infiltration with the aim of enhancing the bioactivity of a new silicon nitride-based biomaterial. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 85.
15. Kašiarová M., Tatarko P., Dusza J., Šajgalík P.: Indentation thermal shock resistance of Si_3N_4-SiC micro-nanocomposites. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 87
16. Sedláček J., Galusek D., Riedel R., Hoffmann M. J.: Preparation of fully dense polymer-derived Al_2O_3-SiC composites by using sinter-HIP technique. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 97.
17. Tatarko P., Kašiarová M., Dusza J., Šajgalík P.: Influence of rare-earth oxide additives on the high-temperature mechanical properties of Si_3N_4-based ceramics. In *Engineering Ceramics 2011: Advanced Research Workshop Engineering Ceramics from Materials to Components,* Smolenice, Book of Abstracts and Programme, p. 98
18. Barborík P., Boča M.: Odolnosť zirkóniových zliatin v roztavených fluoridových soliach. In *ChemZi: 63. Zjazd chemikov 2011*, Tatranské Matliare, č. **13**, s. 86.

30.) Aplikovaný výskum technológie plazmotermických procesov *(Applied Research of Technology of Plasma-thermical 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: 10866 €

Dosiahnuté výsledky:

Projekt je riešený prvým rokom a prebiehajú procesy verejného obstarávania.
V prvej etape bola pozornosť sústredená na štúdium odbornej literatúry, ktorej cieľom bolo vyselektovať na základe dostupných informácii najvhodnejšie systémy ako pre keramické materiály, tak pre materiály vhodné pre taveninové elektródy. Bola vytvorená databáza z relevantných informácií o mechanicko-fyzikálnych vlastnostiach ako aj o koróznej odolnosti týchto materiálov. V nasledujúcej etape sa budeme sústrediť na prípravu rôznych typov keramických kompozitov a ich podrobnú charakterizáciu, s cieľom rozšíriť možnosti ich využitia v plánovanej aplikácii.

31.) Centrum excelentnosti pre keramiku, sklo a silikátové materiály

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: 834974 €

Dosiahnuté výsledky:

Vyhlásené alebo ukončené výberové konanie na prístrojové vybavenie obstarávané v rámci projektu.
Zakúpené experimentálne vybavenie: reometer/viskozimeter, zariadenie na simultánnu termickú analýzu a na termomechanickú analýzu, klimatická komora, vysokoteplotná sušiareň, laboratórne digestory.
Uverejnené vedecké práce:

1. Galusek D., Klement R., Sedláček J., Balog M., Fasel C., Zhang J., Crimp M.A., Riedel R.: Al_2O_3-SiC composites prepared by infiltration of pre-sintered alumina with a poly(allyl)carbosilane. In *Journal of the European Ceramic Society* **31** (2011) 111–119.
2. Švančárek P., Lendvayová S., Galusek D., Hnatko M., Vávra I., Wang X.: Abrasive wear resistance of SiO_2-doped polycrystalline alumina. In *Wear: an international journal on the science and technology of friction, lubrication and wear* **271** (2011) 760-769.
3. Sedláček J., Galusek D., Riedel R., Hoffmann M.J.: Sinter-HIP of polymer-derived Al_2O3–SiC composites with high SiC contents. In *Materials Letters* **65** (2011) 2462-2465.
4. Prnová A., Domanická A., Klement R., Kraxner J., Polovka M., Pentrák M., Galusek D., Šimurka P., Kozánková J.: Er- and Nd-doped yttrium aluminosilicate glasses: Preparation and characterization. In *Optical Materials* **33** (2011) 1872-1878.
5. Ghillányová K., Galusek D., Pentrák M., Madejová J., Bertóti I., Szépvölgyi J., Šajgalík P.: The influence of ageing on consolidation and sinterability of a sub-micron alumina powder, In *Powder Technology* **214** (2011) 313-321.
6. Galusková D., Hnatko M., Galusek D., Šajgalík P.: Corrosion of Structural Ceramics Under Sub-Critical Conditions in Aqueous Sodium Chloride Solution and in Deionized Water. Part II: Dissolution of Si_3N_4-Based Ceramics. In *Journal of the American Ceramic Society* **94** (2011) 3035-3043.
7. Galusková D., Hnatko M., Galusek D., Šajgalík P.: Corrosion of Structural Ceramics Under Sub-Critical Conditions in Aqueous Sodium Chloride Solution and in Deionized Water. Part II: Dissolution of Al_2O_3-Based Ceramics. In *Journal of the American Ceramic Society* **94** (2011) 3044-3052

32.) Centrum komercializácie poznatkov a ochrany duševného vlastníctva Slovenskej akadémie vied *(Centre for knowledge marketing and intellectual property rights of SAS)*

Zodpovedný riešiteľ:	Marián Janek
Zodpovedný riešiteľ v organizácii SAV:	Peter Šimurka
Trvanie projektu:	1.9.2009 / 28.2.2012
Evidenčné číslo projektu:	ITMS kód:26240220006
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Technologický inštitút SAV
Počet spoluriešiteľských inštitúcií:	4 - Slovensko: 4
Čerpané financie:	MŠ: 654 €

Dosiahnuté výsledky:

Bola vypracovaná smernica "Uplatnenie, ochrana a využívanie práv k priemyselnému vlastníctvu organizácií SAV".

33.) Efektívne riadenie výroby a spotreby energie z obnoviteľných zdrojov

Zodpovedný riešiteľ:	Marián Janek
Zodpovedný riešiteľ v organizácii SAV:	Peter Šimurka
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: 37303 €

Dosiahnuté výsledky:

Boli pripravené zmesi na báze $LaSi_3N_5$ a $MgSiN_2$ s prídavkom 1, 2, 4 a 6 mol% európia. Po optimalizácii režimu nitridácie a následného vysokoteplotného žíhania (1500 - 1650 °C) boli pripravené luminofory $LaSi_3N_5$:Eu emitujúce zelené svetlo a $MgSiN_2$:Eu emitujúce červené svetlo. Najvyššiu intezitu emisie mali v oboch prípadoch luminofory s prídavkom 4 mol% Eu.

Bola vypracovaná predbežná rešerš pre koncentrátorovú časť Smartgridu, na základe ktorej sa vypracoval zoznam hlavných konštrukčných častí koncentrátorového výmenníka, pričom sa navrhli rozmery výmenníka pre potreby ohrevu vody a umiestenia výmenníka. Vypracovala sa jeho predbežná schéma, ako aj schéma zapojenia do systému Smartgridu. Uskutočnilo sa verejné obstarávanie na pece špeciálnej konštrukcie pre štúdium fyzikálnochemických vlastností a vysokotlakej pece špeciálnej konštrukcie pre štúdium interakcie chladiaceho média a konštrukčného materiálu.

34.) Generátor vysokoprúdovej plazmy na báze kompozitných materiálov pre účely gazifikácie pevných uhlovodíkov

Zodpovedný riešiteľ: Jaroslav Sedláček
Trvanie projektu: 1.10.2010 / 31.3.2013
Evidenčné číslo projektu:
Organizácia je koordinátorom projektu: nie
Koordinátor: CELIM Slovakia
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: MŠ: 1900 €

Dosiahnuté výsledky:

V úvodnej fáze projektu boli získavané informácie z publikácií v danej tématike. Bol vypracovaný návrh vhodných materiálov použiteľných v konštrukcii generatora, ako z oblasti oxidovej tak aj neoxidovaj keramiky. Pre konštrukciu generátora boli ako potenciálne vhodné vybraté materiály na báze Al_2O_3, TiB_2 a ZrB_2, z ktorých boli pripravené vzorky pre jednotlivé experimentálne testy pre zariadenie vysokoprúdovej plazmy.

35.) Znalostná databáza a expertný systém environmentálneho riešenia havárií straty chladiva v prevádzke jadrovej elektrárne

Zodpovedný riešiteľ: Peter Šimurka
Trvanie projektu: 1.4.2010 / 31.3.2014
Evidenčné číslo projektu:
Organizácia je koordinátorom projektu: nie
Koordinátor: VÚEZ, a.s.
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: MŠ: 10571 €

Dosiahnuté výsledky:

Experimentálne sa sledovala kinetika korózie sklovláknitých izolačných materiálov roztokom chladiva. Získané výsledky sa interpretovali pomocou empirického kinetického modelu Helebranta. Termodynamickým modelovaním sa skúmalo rovnovážne zloženie korózneho média a zloženie precipitovanej tuhej fázy.

Prezentácia výsledkov na 9. Medzinárodnej konferencii Preparation of Ceramic Materials v Herľanoch v dňoch 14.-16.6.2011. Príspevok v zborníku konferencie:

Vlčková P., Chromčíková M., Kaňková H., Faturíková K., Liška M.: Kinetics of zirconia-silicate glasses leaching in distilled water. In *Proceedings of IXth International Conference: Preparation of Ceramics Materials 2011,* Herľany, p. 123-126.

Prezentácia výsledkov projektu na medzinárodnej konferencii Chemistry of Glasses and Glass-Forming Melts, ktorá sa konala v dňoch 4.-8. septembra 2011 v Oxforde. Konferencie sa osobne zúčastnili Ing. Mária Chromčíková, PhD., Doc. Ing. Alfonz Plško, PhD., Ing. Vojtech Soltesz (VUEZ) a Prof. Ing. Marek Liška, DrSc. Príspevky budú po recenznom pokračovaní publikované v European Journal of Glass Science and Technology.

Príspevky s poďakovaním projektu ZDESJE:

1. Soltész V., Vicena I., Liška M., Galusková D., Mattei. J-M.: Corrosion of Bourre glass fibres in borate water solution. In *International Conference on the Chemistry of Glasses and Glass-Forming Melts 2011*, Oxford, Abstracts p. 86.
2. Príspevky v zborníku konferencie Slovenská a česká konferencia o skle, konanej v dňoch 30. 11 - 2. 12. 2011 v Trenčianskych Tepliciach. Zborník bol vydaný ako špeciálne číslo zahraničného recenzovaného časopisu Sklář a keramik:
3. Kaňková H., Vlčková P., Faturíková K., Chromčíková M., Soltész V., Liška M.: Termodynamický model skel soustavy K_2O-CaO- ZnO-ZrO_2-SiO_2 loužených v destilované vodě. In *Sklář a keramik* **61** (2011) 180-184.
4. Soltész V., Liška M., Chromčíkova M., Faturíkova K., Vlčková P., Kaňková H.: Kinetics of static leaching tests of glass fiber insulation – coolant system. In *Sklář a keramik*, **61** (2011) 172-175.
5. Vlčková P., Faturíková K., Kaňková H., Chromčíková M., Soltész V., Liška M.: Statické testy lúhovania sklenej drviny sústavy K_2O-CaO-ZnO-ZrO_2-SiO_2 v destilovanej vode. In *Sklář a keramik* **61** (2011) 185-189.

36.) Priemyselný výskum pre potreby zefektívnenia unikátnej technológie tavenia a tvarovania úžitkového skla

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: 38079 €

Dosiahnuté výsledky:

Vytvorenie „Spoločného pracoviska Ústavu anorganickej chémie Slovenskej akadémie vied a RONA, a.s.“ so sídlom v Lednických Rovniach.

Spoluorganizácia Slovenskej a českej konferencie o skle v Trenčianskych Tepliciach v dňoch 30.11.-2.12.2011. 110 účastníkov z ôsmich krajín, 24 prednášok, 35 postrov.

Zakúpenie pracovnej stanice, softwaru na modelovanie tvarovania a 5 notebookov.

Realizácia verejnej súťaže na rotačný viskozimeter a poistenie majetku.

Publikovanie prác s poďakovaním projektu:

1. Hodoň J., Liška M., Krečmer N.: Theoretical computation of a stress field in a cylindrical glass specimen. *Ceramics-Silikáty* **55** (2011) 55-63.
2. Gašpáreková E., Chromčíková M., Karell R., Vlčková P., Liška M.: Physical properties and chemical durability of selected zirconia containing silicate glasses. In *Ceramics-Silikáty* **55** (2011) 312-318.
3. Chromčíková M., Liška M., Karell R., Gašpáreková E., Vlčková P.: Thermodynamic model and physical properties of selected zirconia containing silicate glasses. In *Journal of Thermal Analysis and Calorimetry* - DOI 10.1007/ s10973-011-1740-1
4. Vrábel P., Šimurka P.: Improvement strategy of technological processes in automatic tableware production. In *Sklář a keramik* **61** (2011) 58-65.
5. Práce publikované v zborníkoch konferencií s poďakovaním projektu:
6. Liška M., Šulcová J., Chromčíková M., Gedeon O., Macháček J.: Molekulová dynamika a termodynamický model skiel sústavy ZnO-MoO_3-P_2O_5. In *Mezinárodní slovenský a český kalorimetrický seminář 201*1, Srní na Šumavě, s. 157-160.
7. Lissová M., Koudelka L., Mošner P., Liška M., Šulcová J., Chromčíková M.: Vybrané vlastnosti skiel sústavy PbO-WO_3-P_2O_5. Mezinárodní slovenský a český kalorimetrický seminář, Srní na Šumavě, s. 161-164.
8. Chromčíková M., Lissová M., Liška M., Mošner P., Koudelka L.: Termomechanické vlastnosti skiel systému PbO-WO_3-P_2O_5. Mezinárodní slovenský a český kalorimetrický seminář 2011, Srní na Šumavě, s. 165-168.

Prezentovaný poster spolu s poďakovaním projektu v publikovanom abstrakte v zborníku:

Paučo T., Jurásek I., Barošová P., Vrábel P., Krečmer N., Kraxner J.: Statistical evaluation of effects of glass melting parameters on glass quality. In *Sklář a keramik* **61** (2011) 228.

Prezentácia obsahu a dosiahnutých výsledkov projektu na medzinárodných konferenciách:

“Bringing together Academia & Glass Industries” Zandvoort, Holandsko, 3.-6. 06. 2011

”Slovenská a česká konferencia o skle”, Trenčianske Teplice, 30. 11. - 2. 12. 2011.

Realizácia a obhájenie diplomových prác:

Fujak S. - Štúdium redoxných rovnováh polyvalentných prvkov v priemyselne vyrábaných kremičitanových sklách a sklotvorných taveninách.

Gaalová P. - Príčiny vzniku nehomogenít pri taviacom procese úžitkového skla.

V rámci projektu boli vypracované literárne rešerše ku kyslíkovému taveniu skla, k elektrochémii elektrického príhrevu a literárny prehľad k používaniu vysokého obsahu črepov pri tavení skla.

Programy: Centrá excelentnosti SAV

37.) Centrum excelentnosti pre funkcionalizované viacfázové materiály

Zodpovedný riešiteľ:	Marián Krajčí
Zodpovedný riešiteľ v organizácii SAV:	Pavol Šajgalík
Trvanie projektu:	1.8.2011 / 1.8.2015
Evidenčné číslo projektu:	
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	SAV: 2200 €

Dosiahnuté výsledky:

Testovali sa dva organokovové polymérne prekurzory na báze polysiloxánov so zložením O-sialonu ($Si_{2-x}Al_xO_{1+x}N_{2-x}$) a β-sialonu ($Si_{6-z}Al_zO_zN_{8-z}$) ako prísady spekania Si_3N_4 keramiky. Optimalizáciou podmienok zosieťovania, pyrolýzy a samotného spekania sa podarilo pripraviť hutný keramický materiál s 15 hm.% prídavkom polymérnych prekurzorov.

Programy: Iné projekty

38.) Vykonanie externého auditu na posúdenie výšky potrebných minimálnych kapitálových výdavkov, ktoré sú potrebné na podporu plánovaného rastu spoločnosti RONA, a.s. Lednické Rovne

Zodpovedný riešiteľ:	Peter Šimurka
Trvanie projektu:	1.10.2011 / 30.10.2011
Evidenčné číslo projektu:	
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	2 - Slovensko: 2
Čerpané financie:	Iné zdroje: 838 €

Dosiahnuté výsledky:

Príloha C - Publikačná činnosť organizácie (zoradená podľa kategórií)

ABC Kapitoly vo vedeckých monografiách vydané v zahraničných vydavateľstvách

ABC01 MADEJOVÁ, Jana - BALAN, E. - PETIT, S. Application of vibrational spectroscopy to the characterization of phyllosilicates and other industrial minerals. In Advances in the characterization of Industrial Minerals: EMU Notes in Mineralogy, 2011, vol. 9, ch. 6, p. 171-226. ISBN 978-0-903056-28-1.

ADCA Vedecké práce v zahraničných karentovaných časopisoch impaktovaných

ADCA01 ANDREJKOVIČOVÁ, Slávka - FERRAZ, E. - VELOSA, A.L. - SILVA, A.S. - ROCHA, F. Fine sepiolite addition to air lime-metakaolin mortars. In Clay Minerals, 2011, vol. 46, p. 621-635. (1.341 - IF2010). (2011 - Current Contents). ISSN 0009-8558.

ADCA02 BAČA, Ľ. - LENČÉŠ, Zoltán - STELZER, N. Phase, microstructure evolution and sintering of Sr-doped TiB2 precursors. In Journal of the European Ceramic Society, 2011, vol. 31, p. 1465-1471. (2.574 - IF2010). (2011 - Current Contents). ISSN 0955-2219.

ADCA03 BAČÍK, P. - OZDÍN, D. - MIGLIERINI, M. - KARDOŠOVÁ, P. - PENTRÁK, Martin - HALODA, J. Crystallochemical effects of heat treatment on Fe-dominant tourmalines from Dolní Bory (Czech Republic) and Vlachovo (Slovakia). In Physic and Chemistry of Minerals, 2011, vol. 38, p. 599-611. (1.876 - IF2010).

ADCA04 BALDES, A. - KLOPPER, W. - ŠIMUNEK, J. - NOGA, Jozef - WEIGEND, F. Acceleration of self-consistent-field convergence by combining conventional diagonalization and a diagonalization-free procedure. In Journal of Computational Chemistry, 2011, vol. 32, p. 3129-3134. (4.050 - IF2010). (2011 - Current Contents). ISSN 0192-8651.

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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.

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

AEC01 JANOTKA, Ivan - KRAJČI, Ľudovít - MOJUMDAR, S.C.. Performance of sulphoaluminate-belite cement with high C4A3 content. In Ceramics-Silikáty, 2007, vol. 51, no. 2, p. 74-81. (0.597 - IF2006). (2007 - Current Contents). ISSN 0862-5468.

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2. [1.1] CUBEROS, Antonio J. M. - DE LA TORRE, Angeles G. - ALVAREZ-PINAZO, G. - CARMEN MARTIN-SEDENO, M. - SCHOLLBACH, Katrin - POELLMANN, Herbert - ARANDA, Miguel A. G. Active Iron-Rich Belite Sulfoaluminate Cements: Clinkering and Hydration. In ENVIRONMENTAL SCIENCE & TECHNOLOGY, 2010, vol. 44, no. 17, p. 6855-6862., WOS

3. [1.1] SELCUK, N. - SONER, I. - SELCUK, E. Synthesis of special cement with fluidised bed combustion ashes. In ADVANCES IN CEMENT RESEARCH, 2010, vol. 22, no. 2, p. 107-113., WOS

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AEF01 ŽIVICA, Vladimír - DRÁBIK, Milan - BALKOVIC, Svetozár. Betón a oheň. In Sanácia betónových konštrukcií : zborník príspevkov zo 6. seminára. - Bratislava : Združenie pre sanáciu betónových konštrukcií pri SZSI : Stavebná fakulta STU, Katedra betónových konštrukcií a mostov, 2009, p. 23-29. ISBN 978-80-227-3215-4.

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AFC01 ŠAJGALÍK, Pavol - HNATKO, Miroslav - LENČÉŠ, Zoltán. Properties of silicon nitride/carbide nano/microcomposites-role of SiC nanoinclusions and grain boundary chemistry. In Ceramic Materials and Componets for Engines. - Weinheim : Wiley-VCH, 2001, p. 559-564.

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GII Rôzne publikácie a dokumenty, ktoré nemožno zaradiť do žiadnej z predchádzajúcich kategórií

GII01 MALKIN, Vladimír - MALKINA, Oľga - REVIAKINE, R. - ARBUZNIKOV, A.V. - KAUPP, M. - SCHIMMELPFENNIG, B. - MALKIN, I. - RUDD, K. MAG-reSpect (a property block of respect) - molecular electronic structure program. In Software: Magnetic ReSpect program, 2003.

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Príloha D - Údaje o pedagogickej činnosti organizácie

Semestrálne prednášky:

RNDr. Juraj Bujdák, DrSc.
Názov semestr. predmetu: Reakčné mechanizmy
Počet hodín za semester: 18
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra fyzikálnej a teoretickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Nové trendy v anorganickej a materiálovej chémii
Počet hodín za semester: 20
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Termická analýza
Počet hodín za semester: 24
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. Ing. Dušan Galusek, PhD.
Názov semestr. predmetu: Technológia špeciálnych anorganických materiálov
Počet hodín za semester: 26
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Oddelenie keramiky, skla a cementu

Semestrálne cvičenia:

Ing. Peter Barborík
Názov semestr. predmetu: Laboratórne cvičenie z anorganickej chémie
Počet hodín za semester: 11
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Ústav anorganickej chémie, technológie a matriálov

Mgr Valéria Bizovská
Názov semestr. predmetu: Všeobecná a anorganická chémia
Počet hodín za semester: 52
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Anna Brtáňová
Názov semestr. predmetu: Všeobecná a anorganická chémia
Počet hodín za semester: 52
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

RNDr. Juraj Bujdák, DrSc.
Názov semestr. predmetu: Pokročilé cvičenie z fyzikálnej chémie
Počet hodín za semester: 72
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra fyzikálnej a teoretickej chémie

RNDr. Juraj Bujdák, DrSc.
Názov semestr. predmetu: Výpočtový seminár z fyzikálnej chémie
Počet hodín za semester: 24
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra fyzikálnej a teoretickej chémie

Mgr. Roman Bystrický
Názov semestr. predmetu: Cvičenia zo všeobecnej a anorganickej chémie
Počet hodín za semester: 48
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Magdaléna Domanická
Názov semestr. predmetu: Cvičenia zo všeobecnej a anorganickej chémie
Počet hodín za semester: 48
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Termická analýza
Počet hodín za semester: 12
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Ing. Ondrej Hanzel
Názov semestr. predmetu: Laboratórne cvičenia z anorganickej chémie
Počet hodín za semester: 26
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Oddelenie anorganickej chémie

Mgr. Michal Vetrecin
Názov semestr. predmetu: Cvičenia zo všeobecnej a anorganickej chémie
Počet hodín za semester: 48
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Semináre:

RNDr. Juraj Bujdák, DrSc.
Názov semestr. predmetu: Fyzikálna chémia
Počet hodín za semester: 24
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra fyzikálnej a teoretickej chémie

RNDr. Juraj Bujdák, DrSc.
Názov semestr. predmetu: Seminár k bakalárskej práci z fyzikálnej chémie
Počet hodín za semester: 48
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra fyzikálnej a teoretickej chémie

RNDr. Juraj Bujdák, DrSc.
Názov semestr. predmetu: Výberový seminár z fyzikálnej chémie
Počet hodín za semester: 24
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra fyzikálnej a teoretickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Seminár z anorganickej chémie 1
Počet hodín za semester: 12

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

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Seminár z anorganickej chémie 2
Počet hodín za semester: 12
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Seminár zo všeobecnej chémie
Počet hodín za semester: 24
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Systematická anorganická chémia 1
Počet hodín za semester: 12
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Systematická anorganická chémia 2
Počet hodín za semester: 12
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

Mgr. Stanislav Kedžuch, PhD.
Názov semestr. predmetu: Výpočtový seminár I
Počet hodín za semester: 24
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Výpočtový seminár I

Ing. Samuel Sas
Názov semestr. predmetu: Proseminár z anorganickej chémie
Počet hodín za semester: 26
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Ústav anorganickej chémie

Terénne cvičenia:

Individuálne prednášky:

doc. RNDr. Milan Drábik, CSc.
Názov semestr. predmetu: Anorganické materiály, vybrané kapitoly
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Ústav anorganickej chémie a technológie

doc. Ing. Zoltán Lenčéš, PhD.
Názov semestr. predmetu: Pokročilé anorganické materiály
Počet hodín za semester: 2
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra anorganickej chémie

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	21			Jozef Kraxner	19
					Pavol Šajgalík	2
Česko	Juraj Bujdák	4			Valéria Bizovská	2
	Stanislav Kedžuch	12			Dagmar Galusková	4
					Veronika Gurišová	8
					Mária Chromčíková	4
					Mária Chromčíková	4
					Mária Chromčíková	4
					Peter Komadel	2
					Peter Komadel	2
					Zoltán Lenčéš	1
					Zoltán Lenčéš	2
					Jana Madejová	3
					Helena Pálková	3
					Pavol Šajgalík	2
					Pavol Šajgalík	2
					Pavol Šajgalík	1
Čína	Michal Korenko	15				
Francúzsko					Miroslav Boča	5
					Milan Drábik	5
					Martin Pentrák	3
					Ľubomír Smrčok	5
					Ľubomír Smrčok	3
					Ľubomír Smrčok	5
Holandsko					Vladimír Malkin	3
Nemecko	Tomáš Plachký	28			Zoltán Lenčéš	3
					Oľga Malkin	31
					Vladimír Malkin	31
					Jaroslav Sedláček	3
					Ľubomír Smrčok	5
					Pavol Šajgalík	2
					Pavol Šajgalík	3
					Pavol Šajgalík	3
					Pavol Šajgalík	3
					Pavol Šajgalík	3
Nórsko					Michal Korenko	4
Poľsko	Jana Madejová	4				
	Helena Pálková	10				
Rakúsko					Milan Drábik	2
					Milan Drábik	2
					Peter Komadel	2
					Zoltán Lenčéš	1
					Vladimír Malkin	1
					Vladimír Malkin	1

					Eva Scholtzová	5
					Eva Scholtzová	12
					Pavol Šajgalík	1
Rusko					Oľga Malkin	13
					Vladimír Malkin	13
Švédsko					Ľubomír Smrčok	9
Taliansko					Dušan Galusek	3
					Ľubomír Smrčok	10
					Peter Šimurka	5
Turecko					Zoltán Lenčéš	3
					Pavol Šajgalík	2
					Pavol Šajgalík	3
Ukrajina	Blanka Kubíková	6				
	Viliam Pavlík	6				
Veľká Británia					Dušan Galusek	5
					Ľubomír Smrčok	4
Počet vyslaní spolu	**9**	**106**			**55**	**282**

(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**
Česko	Jiří Hybler	7	Peter Brázda	1	Evelyn Bolanos	3
	Ondřej Demel	11	Richard Lojka	1	Monika Hrabalová	5
			Tomáš David	1	Vladana Šamajová	5
			Tomáš Grygar	1		
Nemecko					Günter Motz	2
					Michael Hoffmann	2
Poľsko					Malgorzata Kauch	9
					Marcin T. Oszajca	104
Rakúsko					Harald Harmuth	3
					Sabine Pichlbauer	33
Rusko	G. M. Zhidomirov	1				
	Viktoria Krupskaja	14				
Švédsko					Vratislav Langer	4
Ukrajina			Anatolii Kiienko	5		
			Irina Talanchuk	5		
			Petro Talanchuk	5		
			Valentyna Zhuravlova	5		
			Viktor Malyshev	5		
USA					I-Wei Chen	2
					Ivan Tkáč	2
					James D. Kubicki	1
					Rajendra K. Bordia	2
Veľká Británia					Christopher Breen	3
Počet prijatí	**4**	**33**	**9**	**29**	**15**	**180**

spolu						

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

Krajina	**Názov konferencie**	**Meno pracovníka**	**Počet dní**
Austrália	9th IMPRCS	Zoltán Lenčéš	11
		Pavol Šajgalík	11
Česko	13 Th AER Working Group F	Michal Korenko	4
	13Th AER Working Group F	František Šimko	4
	19. Jílová konferencia	Peter Komadel	4
		Martin Pentrák	4
	33.MČSKS	Mária Chromčíková	5
	BSVVVZ	Mária Chromčíková	2
	ENYGF	Peter Barborík	6
		Michal Korenko	7
	JCS-Conference	Anežka Křístková	3
		Oľga Malkin	3
		Vladimír Malkin	3
		Jozef Noga	3
	Konf. Trendy v AT 2011	Michal Korenko	3
	TAVENINY	Miroslav Boča	2
		Veronika Gurišová	2
		Miroslav Hnatko	2
		Blanka Kubíková	2
		Zoltán Lenčéš	2
		Pavol Šajgalík	2
		František Šimko	2
Čína	CICC 2011	Dušan Galusek	7
		Zoltán Lenčéš	6
		Pavol Šajgalík	6
	ICG 2011	Peter Šimurka	8
Francúzsko	SDDR	Peter Komadel	3
		Jana Madejová	3
Holandsko	BAGI	Dušan Galusek	5
		Peter Šimurka	5
Japonsko	FISTC, ISTCP-VII	Jozef Noga	15
Nemecko	The Euro-Indian Week	Vladimír Malkin	10
Nórsko	MS9 2011	Michal Korenko	6
		Blanka Kubíková	6
		František Šimko	6
Poľsko	5th AACC	Milan Drábik	4
	5th IAACC	Milan Drábik	3
	CESTC	Stanislav Kedžuch	4
	CESTC 2011	Jozef Noga	4
Rakúsko	14th OC	Milan Drábik	4
	WMMQC	Stanislav Komorovský	7
		Anežka Křístková	7
		Oľga Malkin	7
		Vladimír Malkin	7
	WTC	Stanislav Kedžuch	5

Srbsko	9th SM	Roman Bystrický	5
	9th SM	Ondrej Hanzel	5
Španielsko	13th ICCC	Milan Drábik	7
Švédsko	12th CECS	Dušan Galusek	6
		Zoltán Lenčéš	7
		Pavol Šajgalík	7
Taiwan	ACTSEA 2011	Dušan Galusek	6
		Zoltán Lenčéš	5
	ACTSEA-2011	Pavol Šajgalík	5
Turecko	EUROCLAY 2011	Juraj Bujdák	7
		Adriana Czímerová	7
		Ľuboš Jankovič	7
		Peter Komadel	7
		Jana Madejová	7
		Helena Pálková	7
		Martin Pentrák	7
		Eva Scholtzová	7
USA	35th ICEACC	Pavol Šajgalík	7
	The 48th CMS	Peter Komadel	11
Veľká Británia	ICCGGM	Mária Chromčíková	7
Spolu	**34**	**66**	**359**

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

Skratky použité v tabuľke C:

12th CECS - 12th Conference of the European Ceramic Society
13 Th AER Working Group F - 13 TH session of the AER Working Group F
13Th AER Working Group F - 13 TH session of the AER Working Group F
13th ICCC - 13th ICCC
14th OC - 14th Osterreichische Chemitage
19. Jílová konferencia - 19. Jílová konferencia
33.MČSKS - 33. Medzinárodný český a slovenský kalorimetrický seminár
35th ICEACC - 35th International Conference and Exposition on Advanced Ceramics and Composites
5th AACC - 5th International Aerated Autoclaved Concrete Conference
5th IAACC - 5 th International Aerated Autoclaved Concrete Conference
9th IMPRCS - 9th International Meeting of Pacific Rim Ceramic Societies
9th SM - The Ninth Students Meeting, Procesing and Application of Ceramics
ACTSEA 2011 - ACTSEA 2011
ACTSEA-2011 - ACTSEA-2011
BAGI - Bringing together Acqademia and Glass Industries
BSVVVZ - Bielokarpatská sklárska výskumno-vývojová a vzdelávacia základňa
CESTC - Central European Symposium on Theoretical Chemistry
CESTC 2011 - CESTC 2011
CICC 2011 - China International conference on highperformance ceramics
CICC 2011 - International conference on highperformance ceramics
ENYGF - European Nuclear Young Generation Forum (ENYGF) in 2011 in Prague
ENYGF - European Nuclear Young Generation Forum in 2011
EUROCLAY 2011 - EUROCLAY 2011 Conference
FISTC, ISTCP-VII - FISTC, ISTCP-VII
ICCGGM - International Conference on the Chemistry of Glasses and Glass-Forming Melts
ICG 2011 - The ICG 2011 Annual Meeting and 1st High-tech International Forum on Glass
JCS-Conference - JCS-Conference Center of AS CR
Konf. Trendy v AT 2011 - Konferencia Trendy v anorganické technológii 2011
MS9 2011 - Molten Salts Chemisty and Technology, MS9 2011 Trondheim, - OTS
MS9 2011 - Molten Salts Chemisty and Technology, MS9 2011 Trondheim - OTS

SDDR - Scientific day in honnour of Dominique Righi
TAVENINY - Interakcia tavenín s progresivnými anorganickými materiálmi
The 48th CMS - The 48th Annual Meeting of the Clay Minerals Society
The Euro-Indian Week - The Euro-Indian Week
WMMQC - Workshop on Modern Methods in Quantum Chemistry-"Relativistic paramagnetic NMR"
WMMQC - Workshop on Modern Methods in Quantum Chemistry "Relativistic paramagnetic NMR"
WTC - "Workshop on Theoretical Chemistry"