**Perlite deposits of the Central Slovakia Volcanic Field (Western Carpathians): Geology and properties**

**Electronic supplement 4: mineral compositions**

Phenocryst and microlites in perlites of both deposits were analyzed using the CAMECA SX100 probe at the Dionýz Štúr State Geological Institute, Bratislava. Analytical procedure and parameters are in the Electronic Supplement 1. Results of EPMA analyses are presented in the form of statistical parameters for selected groups of analyses (Tables S1 to S5) and in the form of graphs (Figs. S1 to S3).

**Table S1:** Statistical parameters of the **plagioclase phenocrysts composition** in perlites (mol. %).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Lehôtka pod Brehmi deposit**  **Eastern part** | | | | **Lehôtka pod Brehmi deposit**  **Western part** | | | | **Jastrabá deposit** | | | |
| **Parameter** | **An** | **Sl** | **Ab** | **Or** | **An** | **Sl** | **Ab** | **Or** | **An** | **Sl** | **Ab** | **Or** |
| **Number** | 23 | 18 | 23 | 23 | 66 | 62 | 66 | 66 | 38 | 36 | 38 | 38 |
| **Minimum** | 38.61 | 0.19 | 44.63 | 1.95 | 31.68 | 0.18 | 47.75 | 1.92 | 22.90 | 0.20 | 57.25 | 3.32 |
| **Maximum** | 53.43 | 0.32 | 57.75 | 3.56 | 49.46 | 0.58 | 63.35 | 4.75 | 38.99 | 0.41 | 70.10 | 8.18 |
| **Median** | 44.00 | 0.25 | 53.19 | 2.80 | 43.21 | 0.28 | 53.64 | 3.02 | 30.70 | 0.31 | 64.71 | 4.31 |
| **Average** | 44.13 | 0.26 | 52.86 | 2.82 | 42.71 | 0.30 | 53.87 | 3.13 | 30.90 | 0.32 | 64.16 | 4.59 |
| **Std. dev.** | 3.67 | 0.037 | 3.28 | 0.42 | 4.42 | 0.083 | 3.87 | 0.61 | 4.48 | 0.050 | 3.57 | 1.05 |

An – anorthite, Sl – slawsonite (Sr-feldspar), Ab – albite, Or – orthoclase

**Table S2:** Statistical parameters of the **feldspar microlites composition** (mol. %) in glassy groundmass of perlites in the **Lehôtka pod Brehmi perlite deposit**.

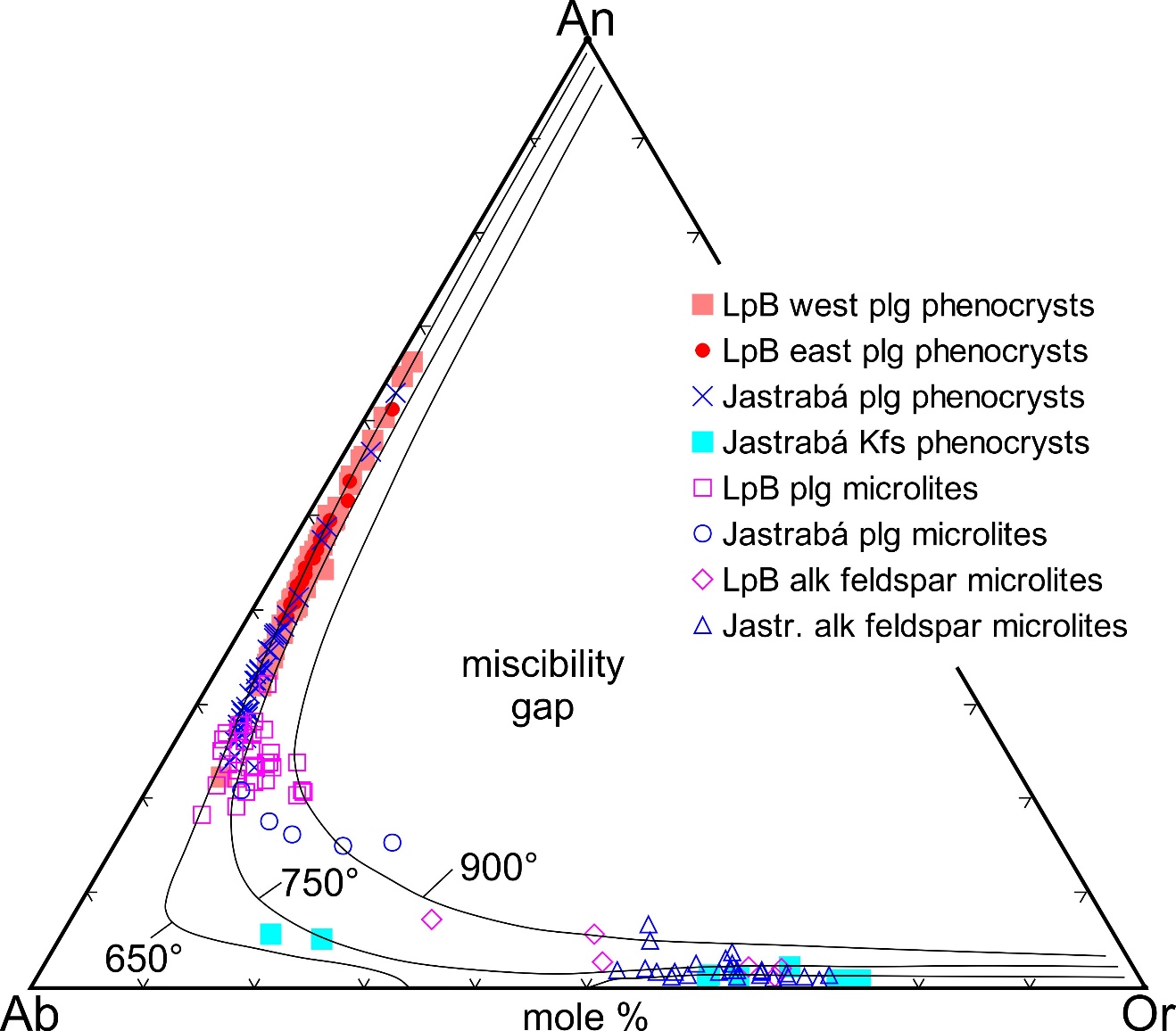
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Plagioclase** | | | | **Anorthoclase** | | | | **Sanidine** | | | |
| **Parameter** | **An** | **Sl** | **Ab** | **Or** | **An** | **Ab** | **Or** | **Cn** | **An** | **Ab** | **Or** | **Cn** |
| **Number** | 35 | 35 | 35 | 35 | 1 | 1 | 1 | 1 | 5 | 5 | 5 | 5 |
| **Minimum** | 18.06 | 0.00 | 62.61 | 4.16 | 7.18 | 71.20 | 31.50 | 2.24 | 1.07 | 31.46 | 45.41 | 1.15 |
| **Maximum** | 31.97 | 0.47 | 75.41 | 14.27 | 7.18 | 71.20 | 31.50 | 2.24 | 5.66 | 47.15 | 64.87 | 2.35 |
| **Median** | 23.38 | 0.34 | 67.68 | 7.36 |  |  |  |  | 2.22 | 34.32 | 62.31 | 1.64 |
| **Average** | 23.75 | 0.30 | 67.97 | 7.85 |  |  |  |  | 2.78 | 38.42 | 57.42 | 1.69 |
| **Std. dev.** | 3.10 | 0.133 | 2.66 | 2.76 |  |  |  |  |  |  |  |  |

An – anorthite, Sl – slawsonite (Sr-feldspar), Ab – albite, Or – orthoclase, Cn – celsiane (Ba-feldspar)

**Table S3:** Statistical parameters of alkali **feldspar microphenocrysts and microlites compositions** (mol. %) in glassy groundmass of perlites at the **Jastrabá perlite deposit**.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sanidine**  **microphenocrysts** | | | | **Anorthoclase microphenocrysts** | | | | **Anorthoclase**  **microlites** | | | | **Sanidine**  **microlites** | | | |
| **Parameter** | **An** | **Ab** | **Or** | **Cn** | **An** | **Ab** | **Or** | **Cn** | **An** | **Sl** | **Ab** | **Or** | **An** | **Ab** | **Or** | **Cn** |
| **Number** | 8 | 8 | 8 | 8 | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 25 | 25 | 25 | 15 |
| **Minimum** | 0.43 | 25.11 | 56.08 | 1.08 | 4.88 | 71.16 | 18.75 | 3.26 | 14.72 | 0.04 | 59.85 | 8.62 | 0.92 | 27.64 | 49.80 | 0.69 |
| **Maximum** | 2.08 | 38.98 | 71.38 | 4.19 | 5.45 | 75.54 | 20.36 | 3.26 | 20.58 | 0.27 | 70.53 | 24.82 | 6.73 | 46.30 | 71.00 | 3.52 |
| **Median** | 0.86 | 28.95 | 67.40 | 2.47 |  |  |  |  | 16.11 | 0.14 | 68.27 | 15.48 | 1.77 | 35.94 | 59.44 | 1.86 |
| **Average** | 1.00 | 30.99 | 65.41 | 2.53 | 5.16 | 73.35 | 19.56 | 3.26 | 16.83 | 0.17 | 66.53 | 16.47 | 2.11 | 36.50 | 60.19 | 2.01 |
| **Std. dev.** | 0.49 | 5.92 | 5.90 | 1.20 |  |  |  |  | 2.35 | 0.10 | 4.42 | 6.40 | 1.33 | 4.96 | 6.17 | 0.85 |

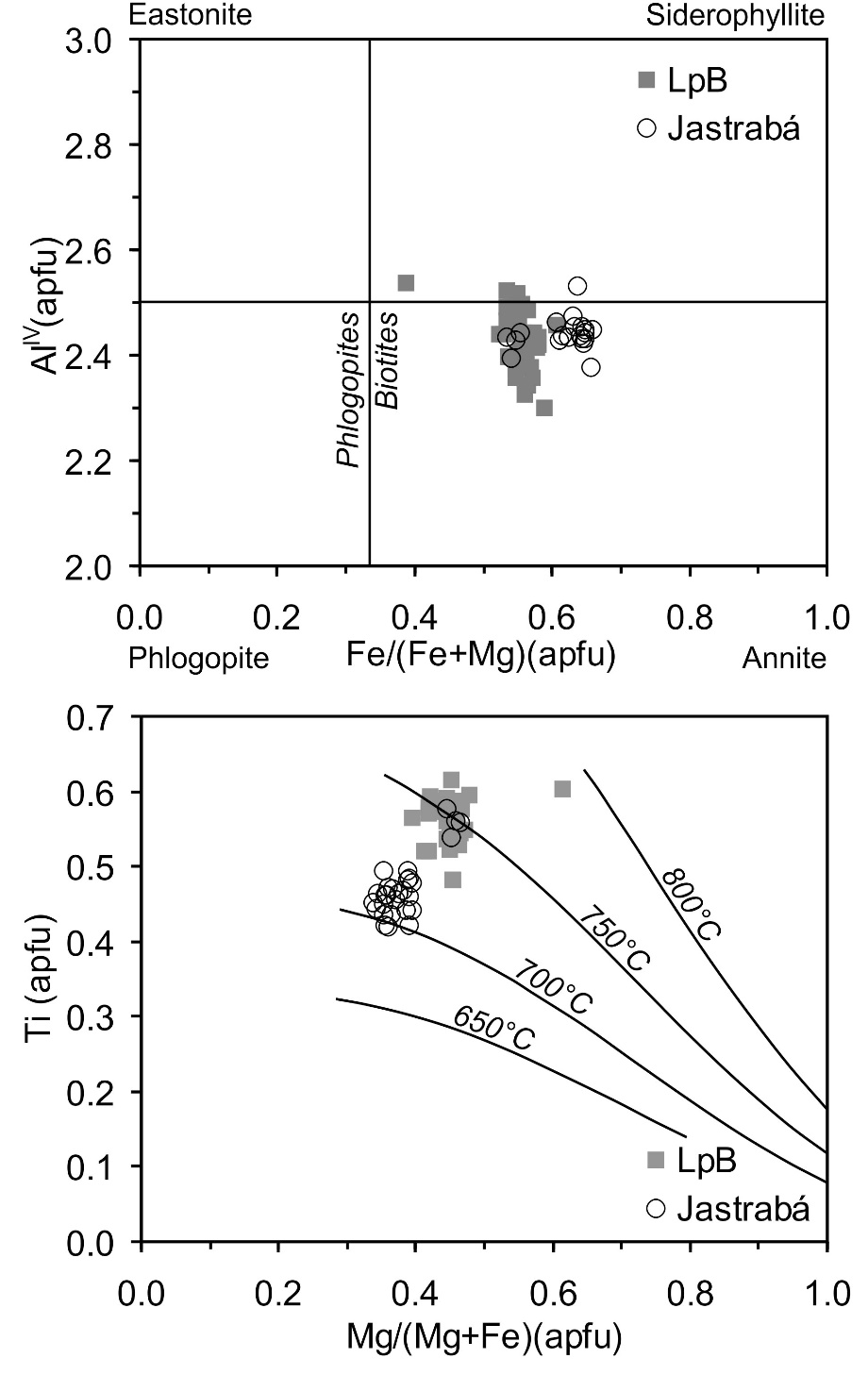
An – anorthite, Sl – slawsonite (Sr-feldspar), Ab – albite, Or – orthoclase, Cn – celsiane (Ba-feldspar)



**Fig. S1.** Plot of perlite feldspars composition in the feldspar ternary diagram (in mole %). Anorthite includes slawsonite component and Orthoclase includes celsiane component. Isopleths of coexisting feldspars are based on the models of Fuhrman and Lindsley (1998) and Elkins and Grove (1990).

**Table S4:** Statistical parameters of the **biotite phenocrysts composition** in perlites (wt. %).

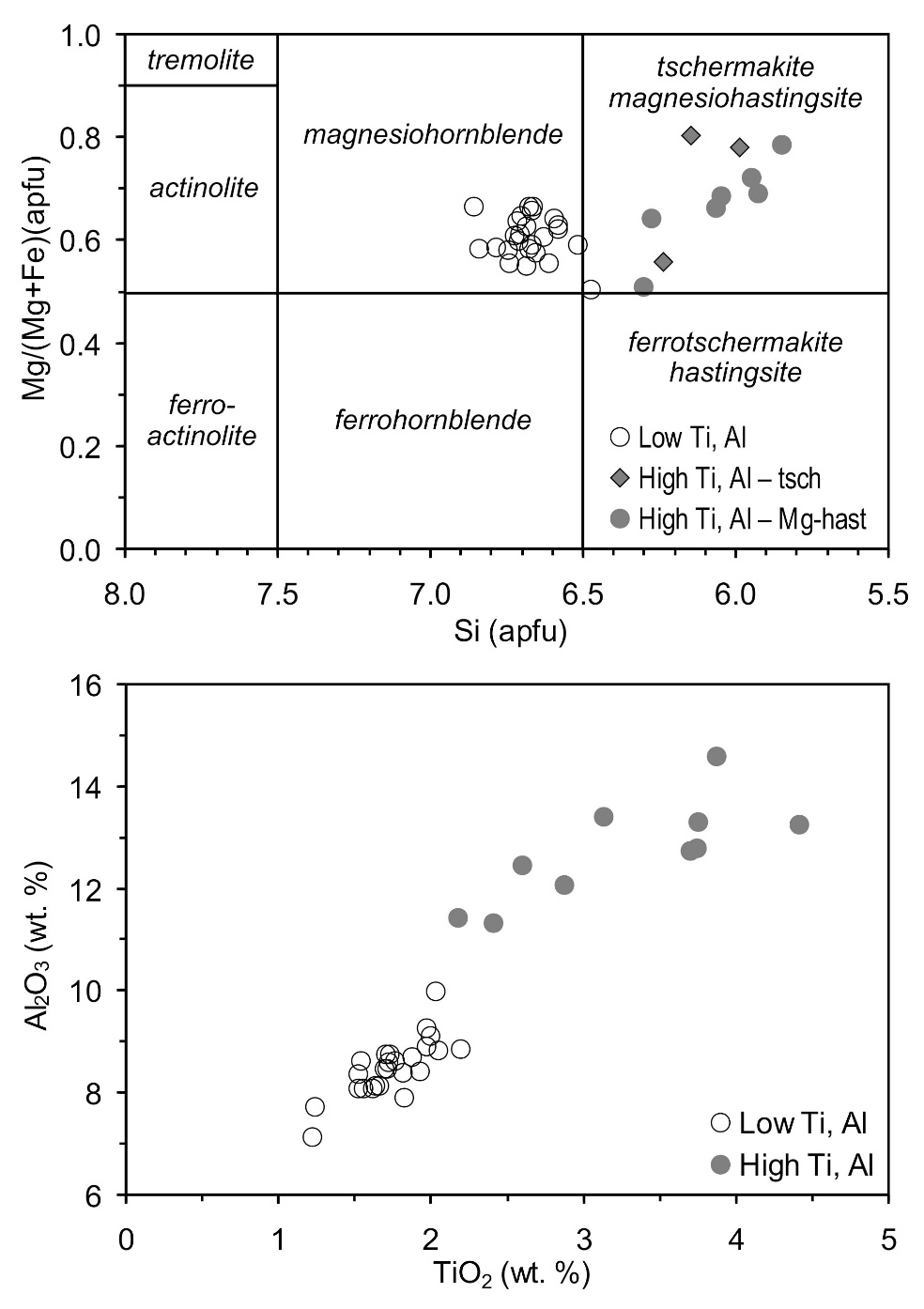
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Lehôtka pod Brehmi deposit** | | | | **Jastrabá deposit**  **Low Ti biotite** | | | | **Jastrabá deposit**  **High Ti biotite** | | | |
| **Parameter** | **SiO2** | **TiO2** | **Fe ox** | **MgO** | **SiO2** | **TiO2** | **Fe ox** | **MgO** | **SiO2** | **TiO2** | **Fe ox** | **MgO** |
| **Number** | 32 | 32 | 32 | 32 | 14 | 14 | 14 | 14 | 4 | 4 | 4 | 4 |
| **Minimum** | 35.33 | 4.21 | 20.47 | 8.72 | 34.67 | 3.50 | 23.86 | 7.27 | 35.53 | 4.71 | 21.04 | 9.56 |
| **Maximum** | 36.46 | 5.36 | 23.94 | 10.65 | 36.03 | 4.25 | 26.43 | 8.44 | 36.34 | 4.93 | 21.62 | 10.29 |
| **Median** | 35.92 | 4.97 | 22.07 | 9.93 | 35.42 | 3.87 | 25.02 | 7.77 | 36.20 | 4.88 | 21.19 | 10.06 |
| **Average** | 35.90 | 4.92 | 22.02 | 9.84 | 35.35 | 3.85 | 25.08 | 7.79 | 36.07 | 4.85 | 21.26 | 9.99 |
| **Std. dev.** | 0.34 | 0.25 | 0.86 | 0.43 | 0.39 | 0.19 | 0.65 | 0.33 | 0.36 | 0.10 | 0.25 | 0.31 |



**Fig. S2.** Plot of perlite biotite phenocrysts composition: up – in the biotite classification diagram (Deer et al. 1992); down – in the Ti vs. Mg/(Mg+Fe) diagram with temperatures after Henry et al. (2005).

**Table S5:** Statistical parameters of the **amphibole phenocrysts composition** (wt. %) for perlites at margins of cryptodomes of the Lehôtka pod Brehmi volcano.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Low Ti and Al group** | | | | | | | **High Ti and Al group** | | | | | | |
| **Parameter** | **SiO2** | **TiO2** | **Al2O3** | **Fe ox** | **MgO** | **CaO** | **Na2O** | **SiO2** | **TiO2** | **Al2O3** | **Fe ox** | **MgO** | **CaO** | **Na2O** |
| **Number** | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Minimum** | 42.25 | 0.25 | 6.52 | 17.09 | 6.18 | 9.23 | 0.42 | 39.42 | 2.18 | 11.32 | 10.94 | 8.68 | 10.30 | 1.21 |
| **Maximum** | 48.38 | 2.20 | 9.97 | 22.92 | 11.11 | 15.85 | 1.49 | 42.27 | 4.41 | 14.60 | 19.26 | 13.30 | 11.80 | 2.29 |
| **Median** | 44.53 | 1.71 | 8.41 | 18.69 | 9.81 | 10.75 | 0.86 | 40.94 | 3.41 | 12.77 | 13.02 | 12.09 | 11.12 | 2.17 |
| **Average** | 44.48 | 1.59 | 8.31 | 19.04 | 9.53 | 10.90 | 0.88 | 40.85 | 3.27 | 12.73 | 13.93 | 11.52 | 11.24 | 2.06 |
| **Std. dev.** | 1.10 | 0.46 | 0.69 | 1.44 | 1.19 | 1.16 | 0.19 | 0.84 | 0.74 | 0.98 | 2.75 | 1.59 | 0.49 | 0.33 |



**Fig. S3.** Plot of perlite amphibole phenocryst compositions: up – in the amphibole classification diagram (Leake et al. 1997); down – in the Al2O3 vs. TiO2 diagram.

**References**

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