

REE distribution in volkhovites – New type of the tektite-like glasses

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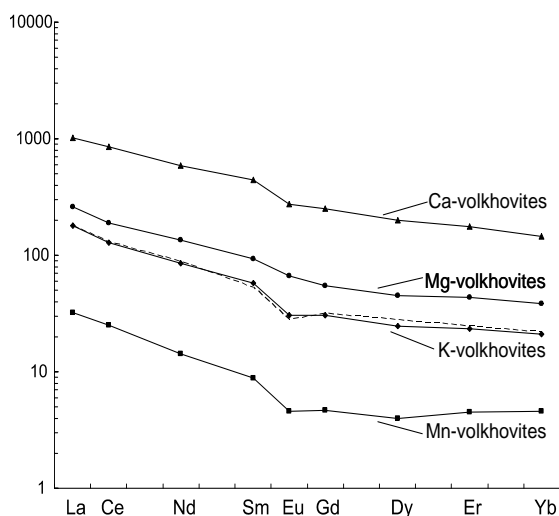
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Volkhovites are the tektite-like glasses of mafic and ultramafic composition; for the first time we have discovered them among fluvial-glacial sediments of Valday glaciations (10-65 thousand years) at the right side of the river Volkhov (North-West Russia). Volkhovite particles are characterized by small size (0.1-3.0 mm), varied microtektite aerodynamic (spherules, drop-shaped, dumbbell-like) and irregular forms, and the perfect safety indicating their postglacial age (Skublov *et al.*, 2007).

Volkhovites can be separated into four groups: Ca-enriched, Mg-enriched, Mn-enriched and K-enriched. REE distribution was studied in volkhovites locally by ion microprobe Cameca IMS-4f (IMI RAS, Jaroslavl, Russia). REE patterns for K-volkhovites and Australasian microtektites are very similar.

We suggest that volkhovites were formed as a result of outburst of the fluidite slag-stone-melt-mud-gas mixture from the crust deep levels up to surface (Skublov *et al.*, 2007).

Figure 1: Chondrite-normalized REE patterns for mean values for different types of volkhovites. Dotted line indicates the mean value for the normal Australasian microtektites (Glass *et al.*, 2004).



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References

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Plešovice zircon – A new natural standard for U-Pb and Hf isotopic microanalysis

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Increasing number of geological applications requires the use of well-characterized and widely available reference materials for in situ analysis. We have established a new natural zircon standard ("Plešovice") for U-Pb dating and Hf isotopic analysis by laser ablation ICP-MS.

The ID-TIMS U-Pb age of the Plešovice zircon has been determined to 336.9 ± 0.2 Ma (95% confidence limits; mean $^{206}\text{Pb}/^{238}\text{U}$ age). The U-Pb ages obtained by LA ICP-MS (3 labs) and SIMS techniques show larger spread but within their analytical uncertainties they are consistent with the TIMS age. Hafnium isotopic composition of the Plešovice zircon appears to be homogenous within and between grains. Combined laser ablation and solution MC ICP-MS analyses gave a mean $^{176}\text{Hf}/^{177}\text{Hf}$ value of 0.282481 ± 0.000013 (95% confidence limits, 87 analyses). Cathodoluminescence and BSE imaging and chemical analyses revealed that discrete zones in the Plešovice zircon are enriched in trace elements and especially in U and Th. Raman spectroscopy suggests that these highly radiation-damaged areas have not undergone any annealing. Our LA ICP-MS analyses did not indicate any Pb-loss but the high intensities of measured U signal require that these areas are avoided during routine U-Pb isotopic analysis.