

UNUSUAL REE DISTRIBUTION PATTERNS IN FLUORITES FROM Sn–W DEPOSITS OF THE QUARTZ–CASSITERITE AND QUARTZ–WOLFRAMITE TYPE

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Fluorite is well known as an excellent tracer for REE fractionation in ore-forming processes (Balashov, 1976; Bau & Dulski, 1992). We present REE data for fluorite from three granite-related Sn–W deposits of the quartz–cassiterite and quartz–wolframite type, located in different regions of Eurasia: Ehrenfriedersdorf (Erzgebirge), Urmi (Russian Far East) and Aqshatau (Central Kazakhstan). Fluorite is a common mineral in all stages of ore-formation on these deposits.

Normally, REE distribution patterns of fluorites are similar to those of the host granites for endocontact samples, i.e., they are characterized by enrichment in both LREE and HREE and a strong negative Eu anomaly. In exocontact, distinct positive Eu anomalies are observed together with some depletion in HREE (Goldstein et al., 1995; see also Fig. 1, left).

In contrast, an unusual REE distribution is found for a rare pale rose or pale blue fluorite in mineral associations relatively uncommon for deposits of the quartz–cassiterite and quartz–wolframite type (Fig. 1, right). Pale rose fluorite occurs in early tourmaline veins with beryl and cassiterite from the Ehrenfriedersdorf deposit (1). The pale rose fluorite in massive quartz–topaz–cassiterite metasomatites from Urmi forms similar intergrowth with tourmaline needles as in Ehrenfriedersdorf (2). In Aqshatau, pale rose fluorite in wolframite-bearing quartz–mica greisen with sericite (3) and pale blue fluorite from quartz–topaz bodies with beryl (4) yield the same REE characteristics as the samples from Ehrenfriedersdorf and Urmi: enrichment in HREE and strong depletion in LREE, occasionally with a weak positive Eu anomaly.

Such REE behaviour cannot be explained by the influence of wall rocks (granites, schists, gneisses, etc.), or fractionation between different minerals and fluids within veins or metasomatites. We assume that these REE distribution patterns represent the primary REE characteristics of the fluids.

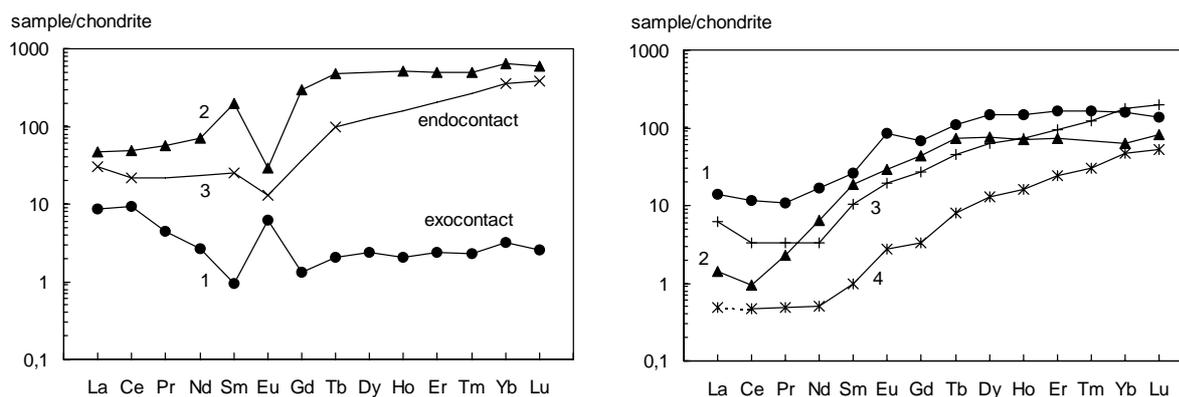


Fig. 1. REE distribution patterns of fluorite from quartz–cassiterite and quartz–wolframite Sn–W deposits: (a) common types and (b) type with unusual pattern: high HREE and low LREE (1 – Ehrenfriedersdorf; 2 – Urmi; 3, 4 – Aqshatau).