

Trace Element Geochemistry in Scheelite from the Kekura Gold Deposit, Chukchi Peninsula, Russia

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We have studied trace element geochemistry in rare scheelite from gold-bearing quartz veins of the Kekura deposit, Chukchi Peninsula, Russia. Scheelite presents pockets up to 1 cm in diameter filled with fine-crystalline aggregate and fine isolated crystals. Scheelite is pale beige and shows light luminescence. Scheelite has been studied with EPMA and LA-ICP-MS. The chemical composition of the mineral is, wt %: 18.94–19.16 CaO, 0–1.44 SrO, 79.83–80.04 WO₃, total is 98.88–100.64. The content of trace elements in scheelite is, ppm: 979–3034 Sr, 71–902 REE, 4–59 Y, 0.5–10 Pb, 4–6 Zr, 0.1–2 U, 1–2 Ta, 0.5–0.9 Nb, and 0–0.2 Mo. The (La/Yb)_N, (Gd/Yb)_N and (La/Ce)_N values are 2.4–14.7, 0–4.2, and 1.0–4.0, respectively. The (La/Sm)_N value is the highest variable, from 0.9 to 275.6. The REE distribution patterns show slight negative slope with positive Eu anomaly (Eu/Eu* 4.4–55.6) and LREE enrichment. The comparison with [1] shows that the Mo and Sr concentrations are close to that in orogenic scheelite. According to [3], the Sr content in scheelite increases from abyssal to hypabyssal gold deposits, from 10 to 2000 ppm. In [2] and [5] it is reported that Mo is transported in fluid as Mo⁶⁺ and incorporates into the structure of scheelite substituting W⁶⁺ under oxidizing conditions. Therefore, low Mo content in the Kekura scheelite appears to reflect reductive nature of mineralizing fluid at relatively high sulfur fugacity. This suggestion is supported by the presence of molybdenite at the Kekura deposit. In addition, reductive conditions of scheelite precipitation are supported by strong positive Eu anomaly [4].

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[1] Sciuba, Beaudoin & Hout (2016) Presentation Quebec Mines. [2] Song et al. (2014) *Am. Min.* 99, 303–317. [3] Spiridonov et al. (1999) *Doklady RAS* 364, 363–365. [4] Poulin et al. (2018) *Can. Mineral.* 56, 265–302. [5] Rempel et al. (2009) *Geochim. Cosmochim. Acta* 73, 3381–3392.