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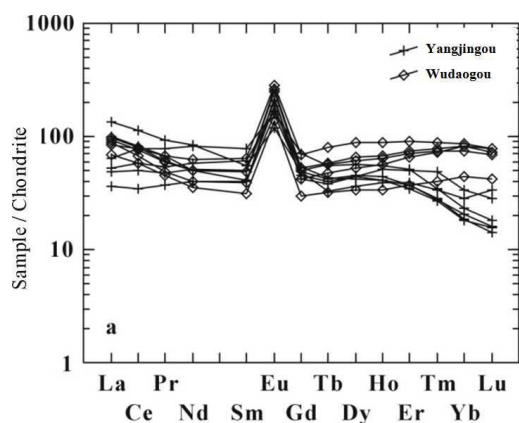
REE Compositions of scheelite and source of ore-forming components for lode tungsten deposits in eastern Yanbian, NE China

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In the past ten years, over ten tungsten deposits or ore occurrences have been discovered in eastern Yanbian, northeast China, including the large-scale Yangjingou deposit and medium-scale Wudaogou deposit. In these deposits, ore bodies are characterized by scheelite-bearing quartz veins hosted by faults and fractures. Scheelite is the only tungsten mineral and is associated with silicification, sericitization, muscovitization, chloritization and carbonation. More and more research data indicate that these deposits formed in a common geological setting, and belong to the same genetic type, namely the scheelite-quartz lode tungsten class. However, there is still controversy on the source of ore-forming components for mineralization in this area.



To determine the ore-forming material source of these tungsten deposits, rare earth element (REE) analysis of the eleven scheelite mineral samples from two typical deposits (Yangjingou and Wudaogou) has been carried out by inductively coupled plasma-atomic emission spectroscopy (ICP-AES) and inductively coupled plasma mass spectrometry (ICP-MS).

Despite being tested by different methods in different laboratories, the scheelite from the two deposits has almost identical REE compositions. In the REE chondrite-normalized diagram (Fig.1), scheelite samples from both deposits are characterized by slight light REE (LREE) enrichment, obvious positive Eu anomalies, as well as unobvious differentiation between LREE and heavy REE (HREE).

Figure 1: Chondrite-normalized REE patterns of scheelite from lode tungsten deposits in eastern Yanbian, NE China

Ghaderi et al. (1999) classified the scheelite in the Archean lode gold deposits in the Kalgoorlie-Norseman area of west Australia into two types due to their REE chondrite-normalized patterns. The type-I scheelites are characterized by enrichment of middle REE (MREE), weak Eu anomalies (positive or negative); the type-II scheelites are defined by large, positive Eu anomalies and no enrichment of MREE. According to this classification, the scheelite from the Yangjingou and Wudaogou deposits belongs to

type-II which was little affected by Ca^{2+} which is often supplied by the carbonate strata. Thus, it can be concluded that ore-forming materials are mainly derived from a deep source. This conclusion is also concordant with what has been drawn from analysis of the fluid inclusion and H-O isotopes.

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References:

[1] Ghaderi M et al. (1999) *Econ Geol* 94: 423-438

