

A geochemical perspective on scheelite mineralization from the Taebaeksan region, Korea

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To understand scheelite mineralization and provide a guideline for a W exploration, we studied trace element characteristics of scheelite from the economic Sangdong W-Mo deposit and from sub-economic orebodies of the Joongdong and Sangdong regions in the southern Taebaeksan (TBS) metallogenic region, Korea.

In the Sangdong W-Mo deposit, Mo substitution into scheelite controls its fluorescence colors under UV light from yellow (Mo up to 51,000 µg/g) to blue (Mo up to 3.2 µg/g). Scheelite of blue fluorescence and high Sr occurs in the low-grade periphery suggesting a low degree of fluid-rock interaction, while yellow fluorescing scheelite accumulates in the high grade center suggesting a high degree of fluid-rock interaction. The fluorescence color of scheelite reflects both the oxidation state and the fluid-rock interaction in the Sangdong deposit, which can be useful for a scheelite exploration in the TBS region.

Nb concentrations show negative association with Eu anomalies in the TBS scheelite, which might indicate a plagioclase fractionation in a batholith-scale magma. Much lower Nb concentrations and Nb/Ta of scheelite from the Joondong area might indicate a relatively smaller magma chamber, which did not achieve a level of fractionation adequate for an economic W mineralization. Nb/Ta ratios and its ranges in the scheelite show a sharp contrast between economic and sub-economic scheelite orebodies in the TBS region, which might also be applicable to explore scheelite.