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GEOLOGICAL SETTING, TECTONIC CONTROL, AND REE GEOCHEMISTRY OF PROTEROZOIC Mo AND W OCCURRENCES IN NORTHERN SWEDEN*

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Although the Svecokarelian of northen Sweden (age range *ca.* 1.89-1.75 Ga) is dominated by granitoids, there are sufficient supracrustal suites preserved to allow a subdividion of the region on the basis of palaeoenvironments. The Skellefte sulphide ore district, a suggested Proterozoic volcanic arc system, subdivides the region into a continental domain in the north (the Karelian Continent) and a marine one in the south (the Bothnian Basin). The Svecokarelian granitoids fall into two main groups, which are as follows.

1. The early stage (1.89-1.84 Ga) comprises granitoid suites with generally wide compositional range. Calcic, calc-alkalic, and alkali-calcic suites are recognized, the latter found in association with tensional or transverse faulting environments just north of the Skellefte district.

2. The late stage (1.80-1.75 Ga) comprises granitoids of more restricted compositional ranges which are derived dominantly from crustal sources of local provenance including Archaean sources in the far north, and Proterozoic metasediments in the Bothnian Basin.

Mo-occurrences are associated with granites of both groups and are located in the continental domain. The largest Mo-enrichments are of aplitic type and occur in the apical parts of granitic intrusions. These aplites are enriched in heavy REE, depleted in light REE and have large negative Eu-anomalies. Other types of Mo-enrichments occur in pegmatites and altered metasupracrustals.

The following simplified genetic model for most molybdenite occurrences in northern Sweden is proposed. In the upper parts of rising granitic batholiths, incompatible elements such as Mo were enriched. The enrichment was most efficient in the apical parts of cupolas rising from the surface of the batholiths; molybdenite was precipitated here in aplites or pegmatites depending on whether an aqueous phase was generated or not. Locally, deep faults reached the ascending batholiths and, owing to decreased pressure, a mobile aqueous phase was generated. This phase, rich in Mo, escaped partly through the permeable fault zones and crystallized as pegmatites or precipitated molybdenite in supracrustals which became hydrothermally altered.

W-enrichments occur both on the continental and the marine side of the Skellefte district. The former are associated with intrusions belonging to the older group (1.89-1.84 Ga), while the latter are associated with highly differentiated intrusions (*ca.* 1.77-1.75 Ga old) that have been generated from the marine metasupracrustals as source material. In the Bothnian Basin, scheelite enrichments are found in metabasites located close to the contact zone of a two-mica granite. Wolframite enrichments have been found in quartz veins located in an even-grained marginal zone of a coarse porphyritic granite intrusion, and in thin greisen veins within another intrusion of coarse porphyritic granite. There is no difference in REE patterns between the granites and the greisen veins, illustrating that the REE have not been affected by the mineralizing solutions.

* Extended abstract

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