Trace element composition of Fe-oxides from Cu-Fe mineralization in the Paleoproterozoic Lätäseno Schist Belt, Finnish Lapland

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IOCG-style Cu-Fe mineralization has been discovered in the Paleoproterozoic Lätäseno Schist Belt, Finnish Lapland, as part of the Mineral Potential project of Geological Survey of Finland, during the 2011-2013 diamond drilling campaign (Hulkki and Taivalkoski, 2014; Karinen et al., 2015; Torppa et al., 2015). Fe oxides (magnetite and hematite) are associated with disseminated chalcopyrite, bornite and pyrite in mafic tuffs, skarns and carbonate-rich breccias (up to 2 % Cu and 19 % Fe). Trace element composition (Mg, Al, Si, K, Ti, Mn, Ni, Cu, Zn, Ca, V, Cr) of Fe-oxides was determined by EPMA at the GeoRessources lab. (Université de Lorraine, Vandoeuvre-lès-Nancy, France) in analytical conditions comparable to those of Dupuis and Beaudoin (2011). A total of 564 analyses on 26 magnetite and 7 hematite grains from 8 samples were carried out. Concentrations of individual trace elements together with Ni/Cr *vs* Ti discriminant diagram indicate that Fe-oxides are hydrothermal rather than magmatic in origin. The discriminant diagrams Ca+Al+Mn *vs* Ti+V and Ni/(Cr+Mn) *vs* Ti+V show that the composition of breccia-hosted magnetite is compatible with IOCG deposits and that the composition of magnetite and hematite in mafic tuffs and skarns is more compatible with Kiruna-type deposits. Altogether, trace element concentrations of Fe-oxides point to two different styles of Cu-Fe mineralization (IOCG and Kiruna) which have been widely recognized regionally, especially on the Swedish side of the border.

References:

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