CONTRASTING STYLES OF WEATHERING IN THE NB ORE DEPOSIT AT SOKLI, FINLAND.

1WALL, F., 1WILLIAMS, C.T., 1WOOLLEY, A.R., 2GARCIA, D., 2MOUTTE, J., 2LEE, M.J. and 3SONNET, P. 1The Natural History Museum, London, UK; 2Ecole des Mines, Saint-Etienne, France; 3Universite Catholique de Louvain, Belgium.

More than 80% of the world's Nb production comes from pyrochlore-rich deposits derived from the lateritic weathering of carbonatites, including mines at Araxa and Catalao in Brazil. In all of these deposits, the ore pyrochlore is a secondary, low-temperature alteration of fresh magmatic pyrochlore of variable composition. The primary carbonatite mineralogy, as well as the weathering process, exerts a key control on the ore pyrochlore composition. In the pyrochlore-hosted potential Nb deposit at Sokli (Finland), both lateritic and saprolitic weathering features are present above the Devonian carbonatite and associated phoscorite. The ore pyrochlore from Sokli displays quite different textural and compositional features from the contrasting weathering regimes. Pyrochlore from the highly-weathered, apatite-rich ores are essentially strontio- and/or bariopyrochlore, whereas pyrochlore from the less-weathered, saprolitic ores are mainly Na, Ca pyrochlore, with only minor Sr and Ba present. At Sokli, the major controls on the composition of the ore pyrochlore are both its fresh precursor composition, which ranges from U-, Ta-rich to Na-, Ca-rich, and the primary rock composition. Here, we compare the pyrochlore mineral chemistry, its alteration and relationship to the host carbonatite from the contrasting weathering regimes at Sokli, with the aim being to establish a general model of pyrochlore alteration during weathering processes, in which examples of pyrochlore from other lateritic-hosted Nb deposits are included.
This study has been part-funded by EU Contracts MA2M-CT90-0038 and BRPR-CT95-015.