The partition coefficients of Nd and Sm for the sulphides of the Palaeoproterozoic layered Cu-Ni-PGE complexes of Fennoscandian Shield

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With the accumulation of knowledge about the REE in various geological processes, the question arises of extending the capabilities of the Sm-Nd method by using new mineral geochronometers. The Sm-Nd method of dating ore processes using sulphide minerals, successfully used on several geological objects, made it possible to determine the main stages of ore formation and confirm geochronologically the conclusions about the syngenetic or epigenetic nature of the ore process [1, 2, 4].

Pyrite, pentlandite, chalcopyrite and pyrrhotite from the main industrial fields of the Fennoscandinavian shield were studied: Monchegorsk pluton, Fedorovo-Pansky intrusion, Pechenga, Penicat intrusion and Ahmavaara (Finland). Using a mass-spectrometric method 35 sulphide monofractions were analyzed. The partition coefficients for Nd and Sm were determined: for pyrite - 0.229 (Nd) and 0.169 (Sm); for pyrrhotite - 0.265 (Nd) and 0.160 (Sm); for chalcopyrite - 0.229 (Nd) and 0.161 (Sm); for pentlandite – 0.158 (Nd) and 0.082 (Sm). The mean values for D_{Nd} are 0.201, for D_{Sm}=0.145 and resulting D_{Nd}/D_{Sm} about 1.4. Similar values (1.3-1.5) were determined in [3, 5].

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