

Peraluminous minerals from Chromite layers in the Fiskenæsset Complex, Greenland

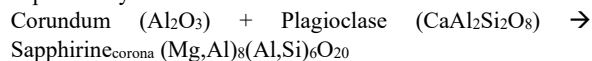
S. VENI¹*, K. SAJEEV¹, B.F. WINDLEY²

¹Centre for Earth Sciences, Indian Institute of Science,
Bangalore, India (*venisudarsan@iisc.ac.in)

²Department of Geology, The University of Leicester,
Leicester, UK

An unusual assemblage of peraluminous minerals (Crm+Spr+Spl) occurs in highly calcic anorthosite of the Neoproterozoic layered megacrystic Fiskenæsset Complex, West Greenland. The spinel grains are enriched in Al and Cr. Cr-rich spinel (chromite) has compositional zoning due to loss of Cr and Fe and gain of Al towards the rim. However, the chromite core has Cr# and Fe# similar to that of other chromites in the Fiskenæsset Complex, which is known for its abundant chromites that have low Cr# (0.405-0.653) and high Fe# (0.614-0.957). Loss of Cr and Fe from core to rim indicates the role of chromite in generating Al-rich spinel that has ~7 wt% of Cr. More than 1 wt% of Cr in the sapphirine comes from the controlling chromite.

Plagioclase coronas that contain Al-rich spinel/plagioclase symplectites; these occur along fractures in corundum and sapphirine indicative of late metasomatic reactions. Proximal to chromite is ruby corundum with a sapphirine corona, which in turn is mantled by anorthite; this mineral reaction is explained by:



The anorthite separates calcic amphibole from sapphirine; the amphibole and plagioclase have similar compositions as those in surrounding chromite-layered anorthosite. These relations suggest that sapphirine and Al-rich spinel formed by metamorphism of highly calcic anorthosite containing chromite.