

Growth of coronal garnet in Koraput Anorthosite Pluton, Eastern Ghats Belt (Domain 2), India, and implications for Gondwanaland assembly

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Anorthosite rocks are restricted to the orogenic belts during Columbia and Rodinia assembly. Garnet is the most common metamorphic mineral in anorthosite and stabilized during Pan-African orogeny [1]. Accordingly, garnet formation reactions provide an idea of P - T conditions during Pan-African orogeny. Mechanism for growth of coronal garnet at biotite-plagioclase interfaces in anhydrous rocks is poorly constrained. Comprehensive textural, mineralogical, and P - T pseudosection analyses are carried out to address the process of formation of garnet corona in anorthositic rocks of Koraput Anorthosite Pluton (KAP), Eastern Ghats Belt (EGB). The NE-SW trending KAP occurs as a small body within domain-2 of EGB and is characterized by anorthosite, gabbro-anorthosite, norite diorite, and ferrodiorite [2,3]. P - T phase topology combined with thermobarometric calculations is used to estimate the P - T condition for the rocks of KAP. P - T analysis suggests that subsolidus growth of biotite and amphibole (retrograde path) formed at 800 – 900°C, 0.8-1.0 Gpa and 700-750°C, 0.5-0.7 GPa, respectively. The final peak metamorphic condition (prograde path: $Pl+Bt+Qtz=Grt+K\text{-feldspar}+H_2O$) for the growth of coronal garnet is constrained at 850-875°C and ~1.2 GPa. Hence, growth of garnet corona in KAP is a part of clock-wise P - T path formed by westward thrusting of EGB granulites over Bastar craton during Pan African East Gondwanaland assembly [4].

References

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