Significance of corona textures in ultrahigh temperature metamorphic assemblages: A study between southern Indian and east- Antarctican sections

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Lithological relationships between continents have been an important topic of research for geoscientists for the past decades. A number of tools are used in developing the updates regarding this topic, and petrology is the rarest among them. In this study, a significant similarity between the mineralogical and textural assemblages are reported between samples from east Antarctica and southern India using corona textures in ultrahigh-temperature metamorphic assemblages.
The region of Enderby Land in north-eastern Antarctica consists of regionally metamorphosed amphibolite to granulite facies rocks. This can be divided into several sub-regions such as- Napier complex (Archean), Rayner complex (Proterozoic), Lützow Holm complex (late Paleozoic) and Yamato-Belgica complex (early Paleozoic). Samples from Akarui point, LHC consist of porphyroblastic corundum partly or completely rimmed by spinel-sapphirine-plagioclase coronas. The matrix assemblage is mainly coarse to medium grained calcic amplibole and minor Fe-Ti phases. Similar unique textural assemblage is also observed in the UHT granulites from Palghat-Cauvery shear zone situated within the Southern Granulite Terrain, southern India. In this sample first two corona around corundum (Spl and Spr) is same as the samples from Akarui point, however the outer rim is of cordierite. The amphibole matrix in the Palghat-Cauvery shear zone sample is of gedrite composition. The reaction between the amphibole matrix and corundum core are further studied towards the formation of reaction coronas and their distribution in both the scenarios. The composition of Sapphirine from both the samples shows a significantly matching peraluminous distribution. The results enable us to undertand the role of local bulk chemical composition in the textural formation at similar metamorphic condition. The resulting observations are further studied through the aspects of correlating continents and a new implication is made considering the two regions as counterparts for the giant Gondwana jigsaw puzzle.

Keywords: UHT, Gondwana, Corona

