

Metamorphism and tectonics of formation patchy charnockites and regional granulites in southern India: implications on the Gondwana Assembly.

Ravindra KUMAR G.R. Centre for Earth Science Studies,
Akkulam, Trivandrum - 695 031, India.

In southern India a distinct pervasive regional granulite facies metamorphism (~2800 m.y) and a late, characteristic, incipient charnockite forming metamorphism (~500 m.y.) are recorded. First few studies on incipient charnockite formation documented them as arrested, initial stages in the pervasive granulite formation. Opinions were also expressed that the regional granulites developed at depth (~800°C, 7-9 Kbar; cf. Nilgiri charnockites) where as the incipient charnockites formed at relatively shallower levels (750°C, 5-7 Kbar; cf. Kabbaldurga, Ponmudi etc.), at a later stage, in compositionally different rocks through prolonged dehydration. With the recent field data of occurrence of incipient charnockites from the middle of the granulite belt (Palghat) and the additional important metamorphic P-T-t data, in this paper, the petrological data of the regional charnockites and incipient charnockites areas are evaluated. This exercise indicate the control of mineral/bulk composition of precursor rocks, the timing, significance of early structures, role played by fluids and the picture of varying pressure-temperature and time across the granulite belt. A near uniformity in composition, P-T record and time of development of regional granulites and diversity in precursor composition, geological association and P-T-t record of incipient charnockites are suggestive of different tectonic settings and contrasting mechanisms. A thermo-tectonic model is proposed to account for the diversity and spatio-temporal relations between charnockites (incipient) and charnockites (regional granulites) of southern India and Sri Lanka, with special reference to Gondwana assembly.