# CARBONIC FLUID INCLUSIONS IN SRI LANKAN CHARNOCKITES : CONSTRAINTS ON GRANULITE PETROGENESIS.

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Spectacular evidence for deep crustal fluid pathways are preserved in several "incipient charnockite" quarries of Sri Lanka, where amphibolite facies gneisses are transformed along structurally-controlled locales of $CO_2$ influx into dry granulites. The gneiss to granulite transformation involves the breakdown of biotite or amphibole to orthopyroxene, the resultant coarse charnockitic assemblage testifying to increased reaction kinetics aided by the influx of fluids. True evidence for fluid influx comes form the carbonic inclusions which commonly occur in the granulite minerals. Visual decrepitation experiments of $CO_2$ inclusions in polished wafers indicate contrastingly increased decrepitation events in charnockite, suggesting higher abundance of $CO_2$ in the charnockite, captured during $CO_2$ flushing along narrow fault/shear zones. The lower densities (0.87 g/cm$^3$) of the preserved carbonic fluids, incompatible with mineral equilibria pressures, are interpreted as a reflection of density reversal along a decompression path. We also report the occurrence of silicate melt and $CO_2$ inclusions in massive charnockites and discuss their characteristics in the light of recent experimental advances on $CO_2$ induced melting in the lower crust. We confirm that charnockite formation was essentially a fluid-controlled mechanism, with $CO_2$ as the critical buffer in lowering the water activities.