

ND-SR ISOTOPES AND WHOLE ROCK GEOCHEMISTRY OF YELAGIRI AND SEVATTUR ALKALINE COMPLEXES, TAMIL NADU, SOUTH INDIA

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Alkaline magmatism during the late Proterozoic is an important event in the northern part of the South Indian granulite terrain, which constitutes a part of East Gondwana. A number of alkaline plutons comprising saturated syenite and ultramafic often associated with carbonatite are found along NE-SW trending lineaments. The Yelagiri and Sevattur plutons have intruded along one such lineament. Whole rock Rb-Sr isochron ages of the Yelagiri and Sevattur syenites yielded 757 ± 32 and 756 ± 11 Ma. The spatial, age, mineralogical and geochemical characteristics suggest their close genetic relationship. The isotope characteristics of the Sevattur carbonatites suggest their derivation from an alkali metal and LREE enriched mantle (epsilon Sr +21 to +24; epsilon Nd -7 to -5). However, silicate rocks of the Yelagiri (epsilon Sr +22 to +24; epsilon Nd -11 to -8) and Sevattur (epsilon Sr +10 to +13; epsilon Nd -10 to -8) are not coincident with the carbonatites. A significant difference of their epsilon Sr is also identified. Contrasting isotopic compositions along with the geochemical varieties within and between silicates and carbonatites argue against them being derived from conjugate immiscible liquid. Instead, it is proposed that silicate rocks are derived independently from isotopically different sources from carbonatites. Nd isotopic compositions of Archean intermediate to felsic crustal rocks in South India do not support that these crustal rocks are direct source of silicate rocks. The source regions of the silicate rocks are considered to be deeper mafic lower-crustal portions and/or upper mantle, which may previously be metasomatized.