Metamagmatic rock series of the Precambrian lower crust of Sri Lanka and their geodynamic implications

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A thorough chemical investigation of all major rock types of the lower continental crust of Sri Lanka has been carried out. More than 500 representative samples selected from various geotectonic units were analysed for up to 42 elements. Evaluation of the data obtained on metamagmatic granulite-facies gneisses reveals the existence of three compositionally and regionally distinct rock series.

(1) Alkaline rock suites enriched in K, F, P, Zr, Sr, Pb, Th, REE and especially Ba are relatively widespread. Similar chemical features are also typical for many metasedimentary rocks. The association of peralkaline and undersaturated members and the occurrence of a meta-carbonatite indicate rift-related magmatism, which presumably was active for a long period.

(2) Extensional tectonics in a continental environment are also documented by a bimodal ferro-basaltic - rhyolitic rock series, which consitutes a major portion of the granulite-facies gneisses of the South-Western Group.

(3) The orthogneisses of the arena structures near Kandy define a calcalkaline rock series which might be the result of subduction related processes.