

MINERALOGICAL AND GEOCHEMICAL STUDY OF PROTEROZOIC NEWANIA CARBONATITES AND ASSOCIATED ROCKS FROM UDAIPUR DISTRICT, RAJASTHAN, INDIA

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Abstract

The Newania carbonatite has been emplaced in Proterozoic Untala granites forming a part of the Pre-Aravalli basement gneisses. These rocks lack any alkaline rock association in the region. The main rock types are granite–gneiss (Untala granites), magnesiocarbonatites, ferrocarnatites, apatite veins and fenites. Carbonatites in the area have a wide variation in textural and mineralogical characteristics. The whole rock geochemical analyses of carbonatites reveal, low silica, alumina and alkalis content. All the carbonatites in the area depict LREE enriched chondrite normalized REE pattern. Fenitization is well developed at Newania, where the carbonatitic intrusion has fenitized the host rock i.e., Untala granite. The formation of fenite in the area involves the addition of considerable amount of Na, K, Fe, Mg and a decrease in Si, Al. There is an enrichment of REE's due to fenitization triggered by the intruded carbonatitic magma enriched in certain REE's. The magmatic origin of the carbonatites in the region is indicated by their intrusive nature within the granites (Untala granites), wide scale fenitization, mineralogical associations, high concentration of REE's, high Sr, Nb and Mn contents and the observed triple junction at the margins of the carbonate minerals. The field relation, mineralogical variation and the distribution of major, trace and REE also support multiple intrusion of carbonatitic magma in the area. The carbonatites reflect a mantle derived magmatic source. Absence of associated alkaline rocks, high MgO content, high concentration of Sr and Nd indicates the mantle origin of these carbonatites.

Keywords: Carbonatites, Geochemistry, Fenitization, Petrogenesis.