

Terrigenous and mantle contributions in Newania carbonatitic body, western India: stable isotopic constraints on a complex petrogenetic history

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The Newania carbonatitic body near Udaipur, India, was initially mapped as a Paleoproterozoic Aravalli dolomitic marble. This elongated body is exposed within the Archaean Banded Gneissic Complex. Carbonatite like features, Sr isotopes and trace element studies confirmed the presence of carbonatite in Newania. Subsequent studies assumed the entire body to be carbonatite s.s., although some of the features were not completely consistent with that (reverse order of carbonatite emplacement beginning with dolomitic carbonatite, ankeritic carbonatite and finally dykelets of calcite carbonatite; Ba, Sr and REE values of Newania 'carbonatites' much lower than the abundance levels of carbonatites; and two distinct Pb-Pb reference ages for dolomitic (2.27) Ga and ankeritic 'carbonatites' (1.55 Ga)). $\delta^{13}\text{C}_{\text{PDB}}$ and $\delta^{18}\text{O}_{\text{SMOW}}$ values vary from -5.9 to -4.1‰ and from +8.2 to +11.5‰, respectively underline doubtless magmatic origin for dolomitic carbonatite. However, the 'ankeritic carbonatites' show corresponding enrichment in heavier isotopes and range from -2.0 to +0.4‰ and +23.9 to 34.3‰, respectively which approximates the range for meta-carbonates. Such signatures reflect source characteristics. The isotopic data allow the discrimination into mantle and terrigenous sources. The isotopic data on ankeritic 'carbonatites' are closely comparable to meta-sedimentary carbonate rocks from Bhukia, south of Newania. Two distinct C and O isotope clusters envisage mantle source for dolomitic carbonatites and significant terrigenous component for ankeritic carbonatite.