

Typical $\delta^{13}\text{C}$ - $\delta^{18}\text{O}$ ratios in mantle-crustal carbonatites of the CAOB

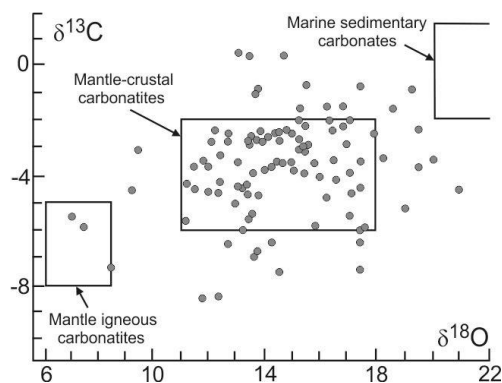
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Evolution of Paleozoic and Mesozoic alkaline magmatism in Western part of the Central Asian orogenic belt (CAOB) was accompanied by formation of carbonatites in intrusive complexes of the Kuznetsk Alatau, Gorny Altai, Tuva, Transbaikalia and Mongolia. Typical features for carbonatites are typomorphic mineral associations and geochemistry of rare elements, as well as isotopic (O, C, S, H, Sr, Nd) composition indicating mantle-crust matter source, e.g. [1-7].

It is shown that values of $\delta^{13}\text{C}$ (PDB) and $\delta^{18}\text{O}$ (SMOW) in rock-forming calcite of such high-temperature carbonatites usually vary between 0 and -8.5 ‰, and between $+9$ and $+20$ ‰, respectively. On the diagram $\delta^{13}\text{C}$ - $\delta^{18}\text{O}$, almost 80 % of its compositions fall between fields of primary mantle igneous carbonatites and field of sea-type normal sedimentary carbonates. Based on this fact we suggest estimating isotopic heterogeneity of carbon dioxide sources for mantle-crust carbonatites as a separate composite «box» with the parameters $\delta^{13}\text{C}$ -2 to -6 ‰ and $\delta^{18}\text{O}$ $+11$ to $+18$ ‰ (see figure).

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