Ore-geochemical specialization and sources of Ural and Timan carbonatite complexes

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The ore specialization of carbonatite complexes of Urals-Timan region has been established: niobium and rare earth-niobium – for the Urals’ carbonatite complexes, the rare-earth – for carbonatites of Timan. The carbonatites of Il’meno- Vishnevogorsky miaskite-carbonatite complex (Southern Urals) are industrial niobium type deposits (pyrochlore type of ores). The Buldym ultrabasic-carbonatite complex (Southern Urals) are rare earth-niobium type deposits (monazite-aeschynite-columbite-pyrochlore type of ores). The Chetlassky carbonatite complex (Middle Timan) are cerium type deposits of bastnesite carbonatites (with monazite-bastnesite type of ores). The Rb-Sr и Sm-Nd isotope characteristics of the Ural carbonatite complexes confirm their mantle source and are similar to those of the ultrabasic-alkaline- carbonatite complexes located in the marginal parts of the platforms (with mantle sources of the moderately depleted DM and FOZO types) and in Precambrian cratons (with the deepest mantle sources of the EM1 type). The Chetlassky carbonatite complex (Middle Timan) has a mantle source with an insignificant addition of a recycled crust component.
Fig.1. Diagram εNd vs. Sr/ Sr of carbonatites and alkaline rocks of the Urals Fold Belt (Ilmeno-Vishnevogorsky and Buldym complexes (A)) and Timan Chetlassky complex (B)) in respect to the mantle sources DM, HIMU, FOZO, EM1, EM2, MORB and OIB [Zindler, Hart, 1986], as well as Kola (KCL) Kramm, 1993], Eastern African (EACL) [Bell, Petersen, 1991], Siberia [Kogarko et al, 1999; Vladykin, 2005], Aldan [Vladykin, 2005] carbonatite complex of latfoms and shields and Himalayas, Tian Shan, Altai, Mongolia collision carbonatite complex of fold regions [Vladykin, 2005; Vrublevsky, Gertner, 2005; Hou et al, 2006].