



## **Origin of diamondiferous rocks from the upper mantle xenoliths in kimberlites**

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New data have obtained for mineral phase compositions of diamondiferous eclogites. The eclogites were found together with diamond-free upper mantle rocks as xenoliths in the explosive kimberlite pipe Udachnaya, Yakutia. By mineral compositions, the diamondiferous peridotites, pyroxenites and eclogites exhibit distinctive typomorphic dissimilarity in comparison with analogous diamond-free rocks. Therewith it is symptomatic that by compositions the rock-forming minerals of diamondiferous rocks are typomorphically similar to the paragenetic minerals included in diamonds.

A physico-chemically unified genetic scenario for diamonds, minerals of the diamondiferous rocks and paragenetic inclusions in diamonds can be explained on the basis of the mantle-carbonatite theory of genesis of diamonds and associated mineral phases. The theory is based on a concordance of mineralogical analytical data and results of physico-chemical experimental studies of multicomponent diamond-forming systems with nature-like compositions (Litvin, 2017).

The next conclusions are justified:

- (1) multicomponent completely miscible silicate-( $\pm$ oxide)-carbonate melts with dissolved carbon can serve as the parental media in petrogenesis of ultrabasic and basic diamondiferous rocks as well as in paragenesis of inclusions with hosting them diamonds;
- (2) genesis of continuous series of the diamondiferous peridotite-pyroxenite-eclogite rocks may be controlled by a fractional ultrabasic-basic evolution of their parental melts; the evolution must be occurred with elimination of olivine and orthopyroxene as a result of their peritectic reactions with melts, that is determined in physico-chemical experiments (Litvin et al., 2016);
- (3) physico-chemically agreed formation of diamondiferous rocks and paragenetic inclusions of peridotitic and eclogitic minerals in diamonds have been happened at the mantle diamond-producing chambers-reservoirs of the parental melts, in this case the diamond-free peridotites, pyroxenites, and eclogites served as the upper mantle rocks enclosing the chambers;
- (4) the ascending streams of kimberlite magma has destroyed the parental chambers and, inside of them, captured diamonds with inclusions, diamondiferous rocks, minerals and their intergrowths; also, the kimberlitic magma has enclosed diamond-free rocks at entrance into and egress from the chambers; the chamber-extracted and enclosing mantle material has been transferred by kimberlite magmas to the crust cumulative cameras where the magmas can harden and liberate strongly compressed fluid which is responsible for formation of explosion pipes.

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References.

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