**Re – created diamond genesis in experiments at 6 – 8 GPa with the use of carbonatitic melts reproducing the compositions of fluid inclusions in natural diamonds.**

LITVIN, Yu. A. Institute of Experimental Mineralogy, RAS, Chernogolovka, Moscow District 142432, Russia

Natural "synthesis" of diamond is successfully re–produced in experiments at 6-8 GPa with the use of multicomponent carbonatitic melts with compositions of fluid inclusions in natural diamonds; the diamonds grown in experiments are similar to natural diamonds from kimberlite and lamproite deposits.

Chemical mode of diamond formation in the Earth's mantle is of profound mineralogical interest, and still controversial. Composition of medium in which diamonds grew is revealed in studies of fluid inclusions in fibrous and cloudy diamonds (Schrauder and Navon, 1994, Izraeli et al, 1998). Assumption that the inclusions represent the medium from which diamond grew (Navon, 1991) is realistic.

We present first experimental evidence that diamond crystallizes efficiently at 6-8 GPa and 1500-1700°C in multicomponent carbonatitic melts reproducing compositions of fluid inclusions in natural diamonds. The melt compositions fall in the $K_2O$– $Na_2O$ – CaO – MgO – FeO – $CO_2$ system in respect to the principal components of the carbonatitic inclusions in the mantle–derived diamonds. Crystallization of diamonds is characterized by high density of nucleation (this indicates a high supersaturation of carbon solution in the carbonatitic melts). As a result, octahedral diamond single crystals, spinel – law and star–like polysynthetic diamond twins, and oriented crystalline aggregates are formed. Diamond seed growth is carried out as well.

Now we can advocate that diamond synthesis in the Earth's mantle might be performed with the use of supersaturated carbon solutions in multicomponent alkaline carbonatitic melts.