

## **Experimental Simulation of Natural Diamond-growth**

<sup>1</sup>SAMOILOVITCH M.I., <sup>2</sup>PETROVSKY V.A., <sup>3</sup>SHILOV Y.A.,  
<sup>4</sup>KHITUNIN V.P. <sup>1</sup>USEISMR, Aleksandrov, Russia; <sup>2</sup>The  
Institute of Geology, Komi Scientific Center, Syktyvkar, Russia;  
<sup>3</sup>Orbita almazinstrument Ltd., Syktyvkar, Russia; <sup>4</sup>Komi  
Pedagogical Institute, Syktyvkar, Russia.

The diamonds, structure analogues of all main mono- and polycrystalline varieties of natural crystals, are synthesized. The formation of segregational forms of nitrogen impurity and disk-shaped accumulations of carbon vacancies is the result of ascending diffusion at high P, T-parameters during after-growth period, that is accompanied by decoloration of crystals, and also output of metal inclusions and dislocations of non-growth origin on a surface of diamonds. The experimental data on derivation of various defects allow to determine temperatures of diamond derivation, namely, 1300-1400<sup>0</sup>C (lower level) for crystals of variety I (on classification Y.L. Orlov), 1100-1300<sup>0</sup>C - for crystals of variety II and external zones of variety IV, and also 1300-1500<sup>0</sup>C for diamonds III and central zones of variety V. It is supposed that under certain conditions in magma the differentiation of silicate melt with separation of a metal phase took place. Then the silicate melt bordering on a layer (probably of small thickness - share of millimeter) of metal melt and was a source of characterized silicate minerals discovered as inclusions in diamonds. Under the data of neutron-activation analysis of those diamond varieties, in which the nitrogen is present in non-segregational form, such metals could mainly be Cr, Fe, Ni, Cu, Mg. The absence of these metals in diamonds containing segregational forms of nitrogen is caused by their diffusion on the surface during the period of after-growth annealing at high P, T-parameters, and also low growth speeds of diamonds in nature.