Nanomaterials Produsedfrom Nanodiamond

Gordeev S., Korchagina S.

FSUE "Central Research Institute for Materials", 191014 St.Petersburg, Russia

In resent years nanodiamond technologies have a great progress. Developed new detonation techniques and high-quality purification methods are a base of increased marked of nanodiamond powder and its products. Positive effects of nanodiamonds additives confirm in wear- resistant coats, polymer composites, and biotechnologies.

One of the prospective areas of nanodiamond application is a development of three-dimensional nanostructural composites combine extra-ordinal functional propeties. As a sample of the composites carbon materials of nanodiamond particles bonded by graphite-like carbon matrix were developed. The materials have high porosity with uniform pore distribution. Pore size is about 7 nm. Porosity in combination with materials strength opens the door for application of the materials in biotechnologies. Pores used for storage and slow delivery of drugs as in vitro as in vivo.

Another type of developed materials is high-porous silicon carbide, produced from nanodiamond. Porosity is more then 60%. Silicon carbide fragments included in material structure have coherent-scattering region sizes less than 30 nm. Luminescent spectra showed that in material synthesis conditions 4H-politype of silicon carbide is formed.

Presented results are shown that carbon and carbide nanomaterials produced by developed methods are prospective for electronics and biotechnologies application.