

## Method for obtaining the hydrosols of detonation nanodiamond with particle size less than 5 nm

*Tuesday, 16 April 2019 17:00 (2 hours)*

Detonation nanodiamond is a commercially available synthetic diamond that is obtained from the carbon of explosives. It is known that the average particle size of detonation nanodiamond is about 4–6nm [1]. There is a size distribution particles in typical hydrosols, so it is possible to separate smaller particles.

In this report we suggest a simple smaller nanodiamond separating method. This method based on using a modified centrifugation and dialysis. The method does not require hazardous or rare chemicals and high-energy or specific laboratory equipment.

The method allows for the production of the detonation nanodiamond hydrosol with a very sharp distribution in size, where more than 85% of particles have a size ranging 1–4 nm.

Obtained particles can be used as a raw material for constructing neutron reflector [2] or for medicine investigations [3].

A.V. Shvidchenko expresses gratitude to the Russian Foundation for Basic Research for its support (grant № 17-03-01217 A). TEM and AFM measurements were performed using equipment owned by the Joint Research Center “Material science and characterization in advanced technology” (Ioffe Institute, St.-Petersburg, Russia) with financial support by Ministry of Education and Science of the Russian Federation (id RFMEFI62114X0007).

### References:

- [1] Aleksenskii, A.E. Technology of Preparation of Detonation Nanodiamond in Detonation Nanodiamonds: Science and Applications. Ed. by Vul’A.Ya., Shenderova O.A. Pan Stanford Publishing, Singapore, 2014, pp. 37-73. ISBN 9789814411271
- [2] V. Nesvizhevsky, U. Köster, M. Dubois, N. Batisse, L. Frezet, Alexei. Bosak, L. Gines, O. Williams, Fluorinated nanodiamonds as unique neutron reflector, Carbon (2018), doi: 10.1016/j.carbon.2018.01.086
- [3] Ansari, S., Satar, R., Jafri, M., Rasool, M., Ahmad, W., Zaidi, S. (2016). Role of Nanodiamonds in Drug Delivery and Stem Cell Therapy. Iranian Journal of Biotechnology, 14(3), 130-141. doi: DOI:10.15171/ijb.1320

**Primary authors:** Mr SHVIDCHENKO, Aleksandr (Ioffe Institute); Mr TROFIMUK, Andrey (Ioffe Institute); Mr KIRILENKO, Demid (Ioffe Institute, ITMO University); Mrs MURAVIJOVA, Diana (ITMO University)

**Presenter:** Mr TROFIMUK, Andrey (Ioffe Institute)

**Session Classification:** Poster session