

AVVISO DI SEMINARIO

Prof. Dr. Alexander Ya. Vul

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Giovedì 13 ottobre ore 10:30
Nell' Aula seminari del Dipartimento di Scienze e Tecnologie
Chimiche

Terrà un seminario dal titolo:

**Detonation nanodiamond. A new approach for doping of single
crystal diamond.**

Proponente; Prof. ssa Terranova

Abstract :

In present-day nanotechnologies, the place which has thus far been occupied by the traditional, so-called “top-down”, processes, is being increasingly claimed by those termed “bottom-up”, i.e., processes based on assembly of nanosized building blocks to develop materials with required properties. The presentation addresses to a new approach for doping of diamond single crystal by the “bottom-up” process. It based on the last results have been obtained by Ioffe Institute group in technology and research of nanodiamonds produced by explosive method – detonation nanodiamond (DND) [1 - 3].

The new method of doping includes two stages: modification of surface of 4-5 nm DND particles with required foreign atom and subsequent formation of single diamond crystal from the particles by high pressure high temperature treatment (HPHT) [4].

At the first stage the stable aqueous suspension consists of 4 - 5 nm DND particles with high negative zeta potential was used as a starting material [5]. The surface chemical modification of the DND particle surface has been made by mixing of the suspension with water solution of required metallic salt. The method of surface doping has been previously successfully applied for attachment of *3d-4f* ions as well as Cu ions on DND surface [6, 7].

One of a new found and attractive property of DND is ability for oriented attachment growth of submicron diamond single crystals from 4 nm grains at HPHT treatment [8]. The similar HPHT treatment was used at the second stage of doping process to produce diamond crystals doped by metal ions.

Results of the doping and discussion of possible applications of the method will be presented.

This research is supporting by the Russian Scientific Foundation (project N 14-13-00795).

References

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