Nanodiamond of Static and Detonation Syntheses and Prospect of Application

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It is well-known that service characteristics are defined by production processes and mainly depend on initial raw quality and technological conditions.

It is reasonable that, p-T conditions of detonation and static syntheses of diamond have essential differences. They also differ with initial raw composition. In case of static synthesis initial raw is graphite and alloys-solvents, mainly transition metals, in case of detonation synthesis it is power explosives: RDX, TG40 alloy etc.

Therefore, diamond nanopowders produced by detonation and static syntheses will differ in service characteristics.

The principal physical, physical-mechanical and physical-chemical properties of diamond nanopowders produced by detonation and static syntheses and carbon composites on their base are considered in this report.

It is shown essential difference in specific surface value of powders, surface chemical composition, EPR-spectra, adsorption potential distribution, thermal stability, abrasive ability, electrochemical and adsorption properties powders as well as composites on their base.

As the results of studies the most perspective fields of using of nanopowders of different syntheses have been found out.

Static synthesis nanopowders and composites on their base are most promising to produce pastes and suspensions, for finishing and polishing of articles (parts of machines and devices) from metals, alloys, ceramics, glass, gems, bioceramics, for thermal stable polycrystals production.

Detonation synthesis nanopowders and composites on their base are most promising as adsorbents, catalysts, electrodes for chemical sources of current.