

Surface and Bulk Modification of Nanodiamond

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Basic privilege of detonation nanodiamond (ND) is its commercial scale production in several industrially developed countries: Russia, Belarus, Ukraine, China, Japan, S. Korea, etc. However the ND potential in academic research and applications is fairly restricted. It is caused by features of structure, and also physical and chemical properties of ND. On their set it is remote enough from an ideal diamond dispersed to separate particles with the size of order several nanometers. The opportunity of predicted, controllable and multi-purpose use of ND can be provided by it. In this direction could be gradually received the ND with considerably less uncertain properties, in comparison with initial powder material being, actually considered as industrial semi product.

That is why our main goal is not only ND cleaning from non-diamond and non-carbon impurities, but also an influence on volume and a surface content and properties of individual ND particle. Only in this direction will be possible to convert initial ND as industrial semi product

In engineered nanoparticles what worth named as diamond nano fire- bricks.

By high temperature gas phase chlorination with subsequent rigid hydrogenation we have remarkable purification of ND. Its chemical content, according to electron-probe microanalysis change towards

Much pure chemical state. Every impurity, except nitrogen, reduces up one and more order of magnitude. Other result is surface and bulk (preferably in sub-surface layer) accretion of chlorine, revealed by FTIR and Auger-spectroscopy and XPS. The details of surface and bulk ND modification will be discussed.