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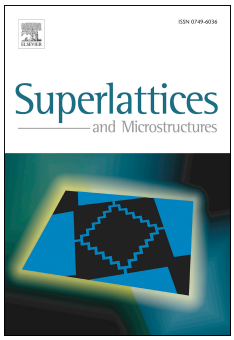

Ultracentrifugation for ultrafine nanodiamond fractionation

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Ultracentrifugation for ultrafine nanodiamond fractionation

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Abstract

In this paper we propose a method for ultrafine fractionation of nanodiamonds using the differential centrifugation in the fields up to 215000g. The developed protocols yield 4-6 nm fraction giving main contribution to the light scattering intensity. The desired 4-6 nm fraction can be obtained from various types of initial nanodiamonds: three types of detonation nanodiamonds differing in purifying methods, laser synthesis nanodiamonds and nanodiamonds made by milling. The characterization of the obtained hydrosols was conducted with Dynamic Light Scattering, Zeta potential measurements, powder XRD and TEM. According to powder XRD and TEM data ultracentrifugation also leads to a further fractionation of the primary diamond nanocrystallites in the hydrosols from 4 to 2 nm.

Keywords:
nanodiamond, nanoparticle, fractionation, ultracentrifugation, DLS, XRD

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