

Structural Transformation of Boron Nitride Nanoparticles in Benzene under Moderate Conditions

Zefeng Lai^{a,b}, Lingling Zhu^a, Lili Yu^a, Zhi Chen^{a,b}, Xian Zhao^a, Qilong Wang^b, Deliang Cui^a, and Minhua Jiang^a

^a State Key Lab of Crystal Materials, Shandong University, Jinan 25 0100, P. R. China

^b School of Chemistry & Chemical Engineering, Shandong University, Jinan 250100, P. R. China

Reprint requests to Prof. Dr. De-Liang Cui. Fax: +86-531-88361856. E-mail: cuidl@sdu.edu.cn

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This work reports a new route for preparing cubic BN (*c*-BN) nanocrystals under moderate conditions. Considering the instability of BN nanoparticles, we have investigated the structural transformation of BN nanoparticles in benzene. The results revealed that a great deal of hexagonal BN (*h*-BN) nanoparticles had been converted into *c*-BN or wurtzitic BN (*w*-BN) at 280 °C and 50 MPa. As the temperature was increased from 280 to 300 °C, *h*-BN nanoparticles gradually disappeared, and the content of both *c*-BN or *w*-BN increased. Similarly, increase of pressure or hot-pressing time showed the same effect. These results may open up an opportunity for synthesizing other superhard nanomaterials such as diamond and cubic carbon nitride under moderate conditions.

Key words: Boron Nitride Nanoparticles, Solvent Hot-pressing Route, Structural Transformation, Characterization