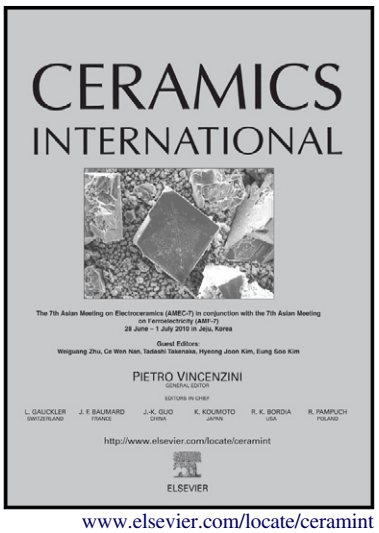

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Dual Templates route for the Synthesis of Hierarchical Porous Boron Nitride

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Abstract

Here, a facile dual templates method for the synthesis of hierarchical porous boron nitride (HPBN) powders is reported. For this purpose, ammonia borane (AB) and polystyrene latex/ cetyltrimethyl ammonium bromide (CTAB) were used as BN precursor and inorganic templates, respectively. The as-synthesized material was pyrolyzed at 1150°C under ammonia atmosphere resulting in the formation of white BN powder. The typical N_2 sorption analysis demonstrated formation of porous BN with presence of macro/meso and micropores. Transmission electron microscope (TEM) observations revealed the existence of rather uniform macropores with 55-60 nm in diameter, as well as wormlike mesopores and micropores extended between macropores walls. X-ray diffraction (XRD) and high resolution TEM (HRTEM) analyses displayed the formation of turbostratic-BN with atomic layer distance of 0.37 nm. HPBN powders showed fast adsorption rate of methylene blue (MB) solution and high adsorption capacity of 263.1 mg g^{-1} for MB at room temperature.

Keywords: Hierarchical porous BN, Polystyrene latex, CTAB.

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