

B 나노입자와 BN/B 나노 peanut의 제조

From B nanoparticles to BN/B nano-peanuts

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Boron chemistry includes many technical applications such as nuclear reactor control, pyrotechnic flares, rocket igniter, semiconductors, protective coatings and refractory materials. Elementary boron is commonly prepared by the reduction of boron compound with hydrogen or magnesium. In this work, amorphous boron nanoparticles were prepared by arc-decomposing diborane, which had ideal morphologies in comparison with that of those fabricated by furnace or laser heating diborane. Peanut-shaped boron nitride encapsulating boron nanocapsules were fabricated by nitridation of amorphous boron nanoparticles. Unique core/void/shell structure of the nanocapsules was observed by using a high-resolution transmission electron microscopy. The mechanism of growing the BN nanocapsules by a catalyst free process was distinctly different from the process of arc discharge or laser heating.