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**Combustion Synthesis of Ultra Fine BN/AlN and
BN/B₄C Composite Powders:
Role of Gasifying Compounds**

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ABSTRACT

Aluminum diboride was chosen as an initial reagent to obtain BN/AlN composites with high homogeneity. By comparing the specific surface area of products, it was established that this parameter can be increased (up to 10-24 m²/g) by increasing the amount of boron nitride. The gasifying compounds have essential influence on the formation of submicron particles in products. Even at their negligible amounts the specific surface area can increase by a factor of 2, and at higher amounts (close to the combustion limit) by 4 times. The maximum value for specific surface area (86 m²/g) was obtained for the 80%BN+20%AlN composite.

It was established that it is impossible to obtain BN-B₄C composite by direct interaction between elements (B, C and N₂). Therefore another way was developed aimed at synthesizing BN-B₄C composite under the activated combustion mode. Organic nitrogen containing compounds (ONCC) were used as sources for both the carbon and nitrogen.

Keywords: SHS, composites, chemical activation, active additive, gasifying agents.