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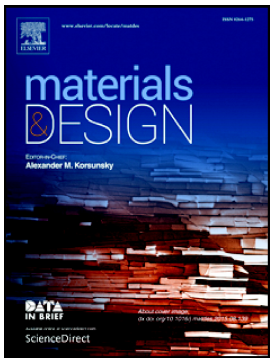

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Large-scale fabrication and utilization of novel hexagonal/turbostratic composite boron nitride nanosheets

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ABSTRACT

In this report, we have developed a scalable approach to massive synthesis of hexagonal/turbostratic composite boron nitride nanosheets (*h*/*t*-BNNSs). The strikingly effective, reliable, and high-throughput (grams) synthesis is performed *via* a facile chemical foaming process at 1400℃ utilizing ammonia borane (AB) as precursor. The characterization results demonstrate that high quality of *h*/*t*-BNNSs with lateral size of tens of micrometers and thickness of tens of nanometers are obtained. The growth mechanism of *h*/*t*-BNNSs is also discussed based on the thermogravimetric analysis of AB which clearly shows two step weight loss. The *h*/*t*-BNNSs are further used for making thermoconductive *h*/*t*-BNNSs/epoxy resin composites. The thermal conductivity of the composites is obviously improved due to the introduction of *h*/*t*-BNNSs. Consideration of the unique properties of boron nitride, these novel *h*/*t*-BNNSs are envisaged to be very valuable for future high performance polymer based material fabrication.

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