

Graphene Nanoplatelets derived from the Spheroidal Graphite

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Abstract

Various spheroidal graphite materials, such as the artificially spheroidized graphite (b-SNG) and the graphitized mesophase microbeads (g-MCMB), were processed to obtain expanded graphite and graphene nanoplatelets. GIC (graphite intercalation compound) via exfoliation was used as the experimental process. While b-SNG was successfully converted into both expanded graphite and graphene nanoplatelets, g-MCMB, however, was not effectively exfoliated into graphene platelets. The exfoliation degree of the produced graphene nanoplatelets was found to be proportional to the average diameter of starting materials. Exfoliated graphene platelets prepared from b-SNG with average diameter of 50 μm were analyzed to have the averaged lateral size of 45.4 μm at the thickness of ca. 5 nm. The I_D/I_G ratio was analyzed to be lower in the graphene platelets originated from b-SNG (0.026-0.064) than similarly-sized graphite flakes (0.076) suggesting structural defect of graphene nanoplatelets can be influenced by the raw material's shape and morphologies.

References

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Figure

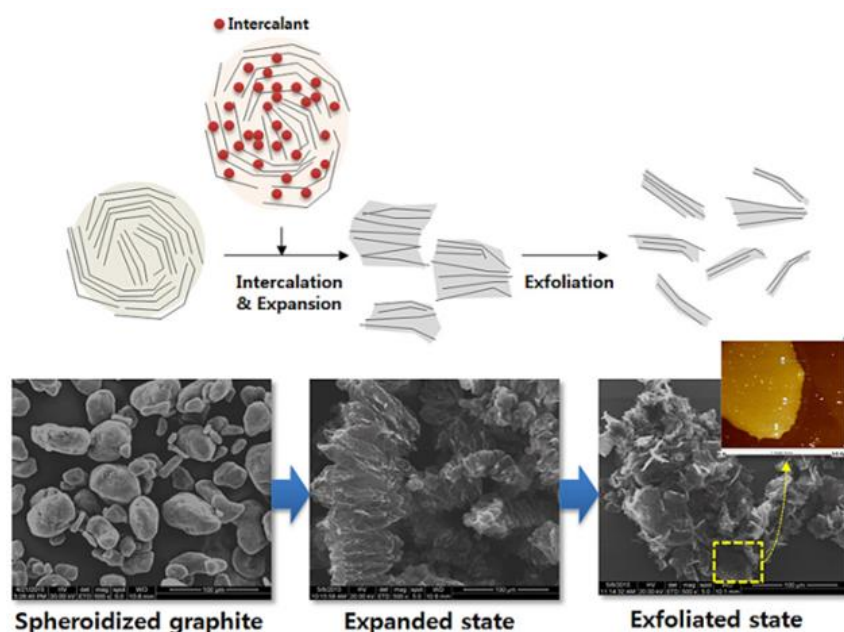


Fig. Diagram of experimental scheme