

Synthesis of graphene sheets formed by reaction of carbon monoxide with partially nitrated alumina powder

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Graphene sheets were synthesized by the reaction of partially nitrated alumina (PNA) powder under a mixed gas flow of carbon monoxide (CO) and argon. The former powder was obtained by the carbothermal reduction and nitridation of a mixture of  $\text{Al}_2\text{O}_3$  and carbon powders under a flow of  $\text{N}_2$ . The graphene sheets, which wrapped alumina particles, were formed by the reduction of CO. The products were characterized by powder X-ray photoelectron spectroscopy and scanning electron microscopy high-resolution transmission electron microscopy. Their characteristics depended on the species of  $\text{Al}_2\text{O}_3$ , calcination temperature and duration. The powders are expected to be used as a thermal conductive filler.