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Graphene synthesis by calcination of ethylene-glycol intercalated layered silicates: x-ray and Raman scattering studies NOBORU WADA, TOMOYA SUSA, Toyo University — Excellent electrical, mechanical and chemical properties of graphene make it fascinating for various applications including high-speed and high-performance electric devices. Although there have been many synthesis methods innovated to obtain graphene in the past, a simple and controllable synthesis method of graphene mass production is still being pursued for such applications. Here, layered silicates are chosen as a host material to intercalate ethylene glycol (EG). EG-intercalated layered silicates are then calcinated in air or vacuum to synthesize graphene between the silicate layers. Layered silicates used are taeniolite, fluorinated mica and vermiculite. Our Raman scattering and x-ray diffraction experiments suggest that graphene may be made between the silicate layers after calcination. In particular, second-order Raman peaks found in vermiculite samples indicate that vermiculite may be most suited to synthesize well-crystallized graphene among the layered silicates used.

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