

Supplemental Information for:

Vapor-dissociation-solid Growth of 3D Graphite-like Capsules with Delicate Morphology and Atomic-level Thickness Control

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Experimental Details:

Graphite-like Capsules (GCs) over various materials are synthesized on metal oxides including TiO_2 , ZnO , SnO_2 and $\text{BaFe}_{12}\text{O}_9$ through the CCVD method. The main synthetic process is depicted in the Experiment Section of the manuscript. The preparation of $\text{TiO}_2@\text{CC}$ is carried out at 700 °C for 5 S (Figure 1a) and 30 min (Figure 1b) with an acetylene flow of 20 mL/min without nitrogen (the following case is similar). $\text{ZnO}@\text{GCs}$ is synthesized at 400 -800 °C under 50 mL/min acetylene. For ZnO nanorod, the temperature is controlled at 400 °C for 1 min (Figure 1c). For T-ZnO, the reaction condition is 800 °C for 60 min (Figure 1d). The $\text{SnO}_2@\text{GCs}$ is prepared at 500 °C for 10 min under 30 mL/min acetylene (Figure 1e). $\text{BaFe}_{12}\text{O}_9@\text{GCs}$ is prepared from the decomposition of acetylene (40 mL/min) at 400 °C for 5 min (Figure 1f).

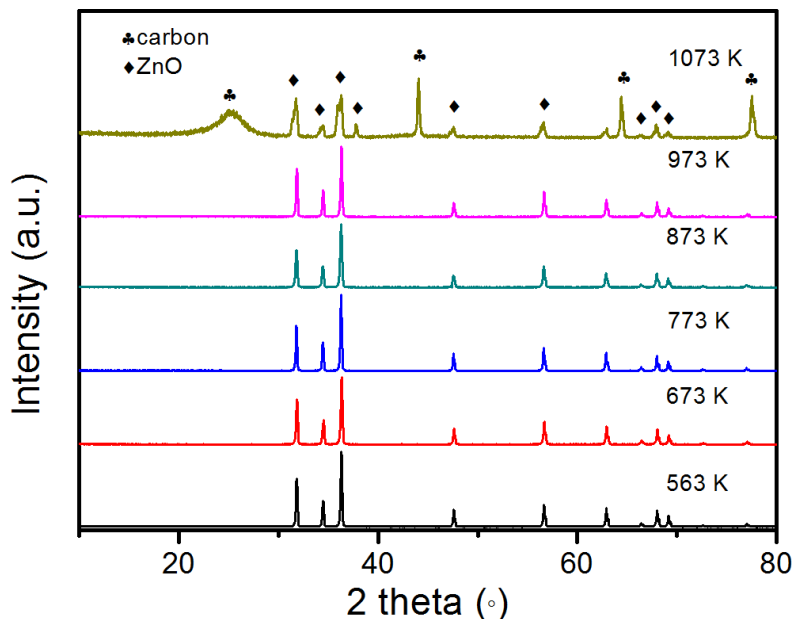


Figure S1. XRD data of carbon capsule hybridize T-ZnO at different reaction temperatures for 60 min under a 50 mL/min C_2H_2 flow.

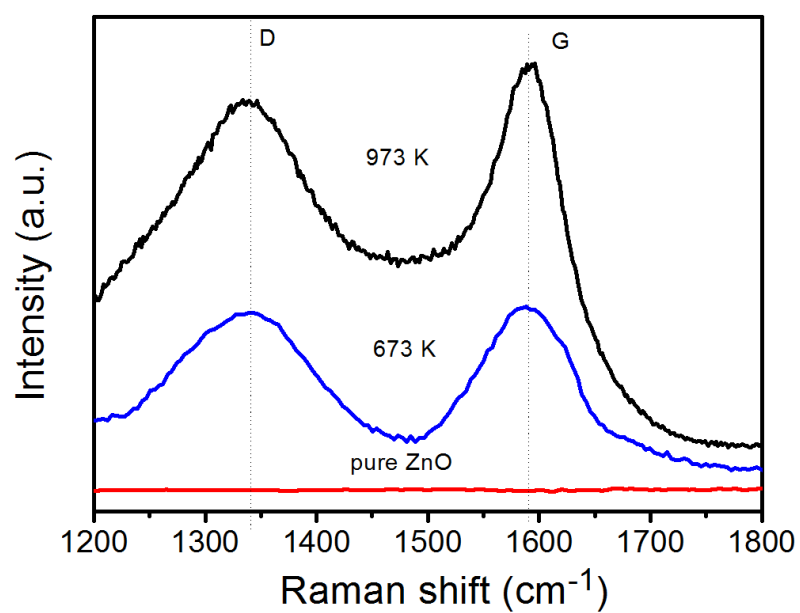


Figure S2. Raman spectra of pure T-ZnO and T-ZnO@GCs obtained at different reaction temperatures for 60 min under a 50 mL/min C₂H₂ flow.