Supporting Information for

Synthesis and Characterization of Highly Crystalline Graphene Aerogels

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Figures

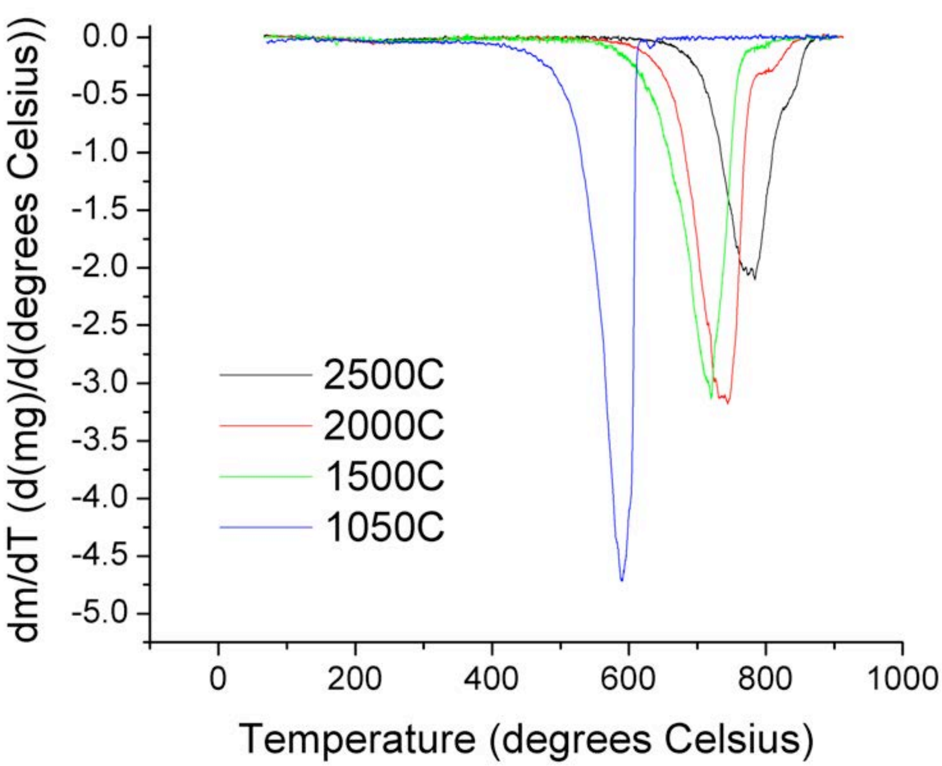

Figure S1. Plot of the mass loss rate (dm/dT) as a function of temperature for the GMA treated at 1050°C, 1500°C, 2000°C, and 2500°C. The temperature at the peak of each curve is taken as the oxidation temperature, T_0.

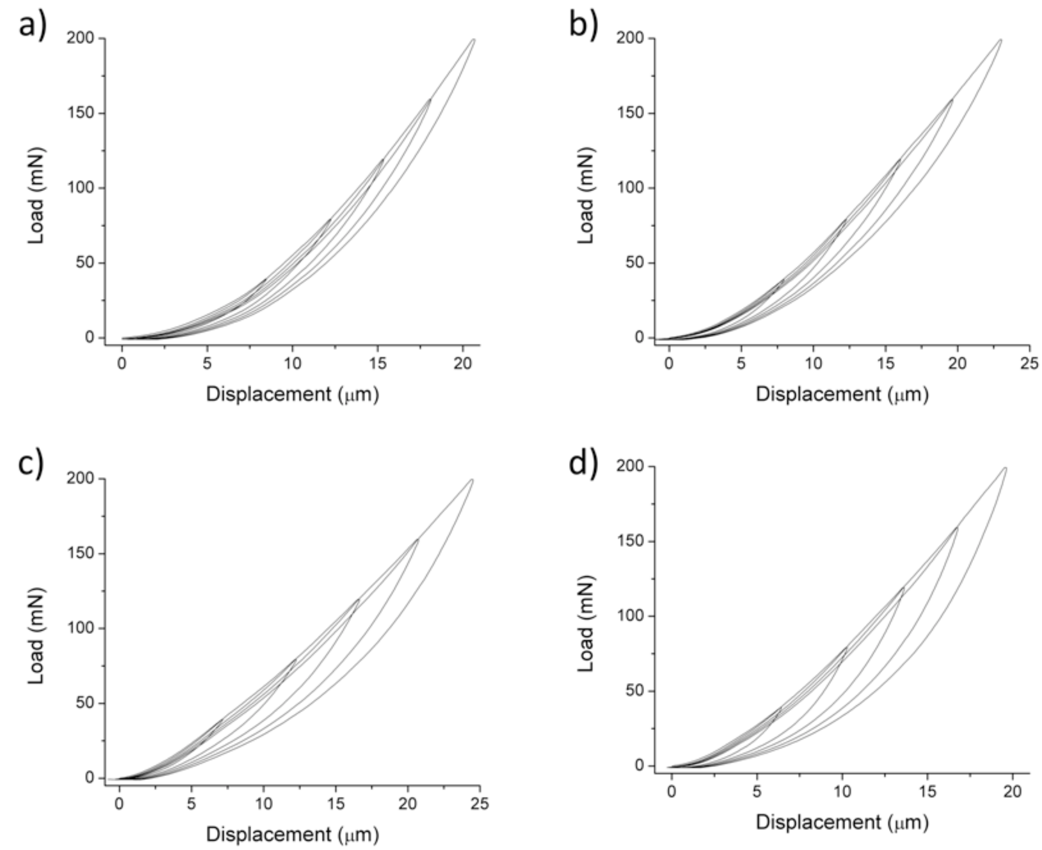

Figure S2. Load vs displacement curves for GMA annealed at a) 1050°C, b) 1500°C, c) 2000°C, and d) 2500°C.

Discussion

Thermal Gravimetric Analysis. The first derivative (rate of mass loss) of the TGA curves, dm/dT, where m is mass and T is temperature, were used to determine the oxidation temperature, T_O. Figure S1 shows dm/dT as a function of temperature. T_O is defined as the temperate at the maximum rate of mass loss (dm/dT_{max}), or peak values observed in Figure S1.

Nanoindentation. A load vs displacement plot for GMA samples annealed at different temperatures is shown in Figure S2. Note that the size of the hysteresis loop between the loading and unloading curves increases with increasing temperature, suggesting increasing energy dissipation. The % energy dissipated, (E_D) reported in the manuscript, was

$$E_D = \frac{(A_{load} - A_{unload})}{A_{load}} * 100\% \quad (1)$$

where A_{load} is the area under the loading curve and A_{unload} is the area under the unloading curve.