Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Facile Fabrication of Graphene Composite Microwires via Drying-Induced Size Reduction of Hydrogel Filaments

Hyung-Jun Koo, Sung-Kon Kim and Paul V. Braun

Materials Science and Engineering Department, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA.

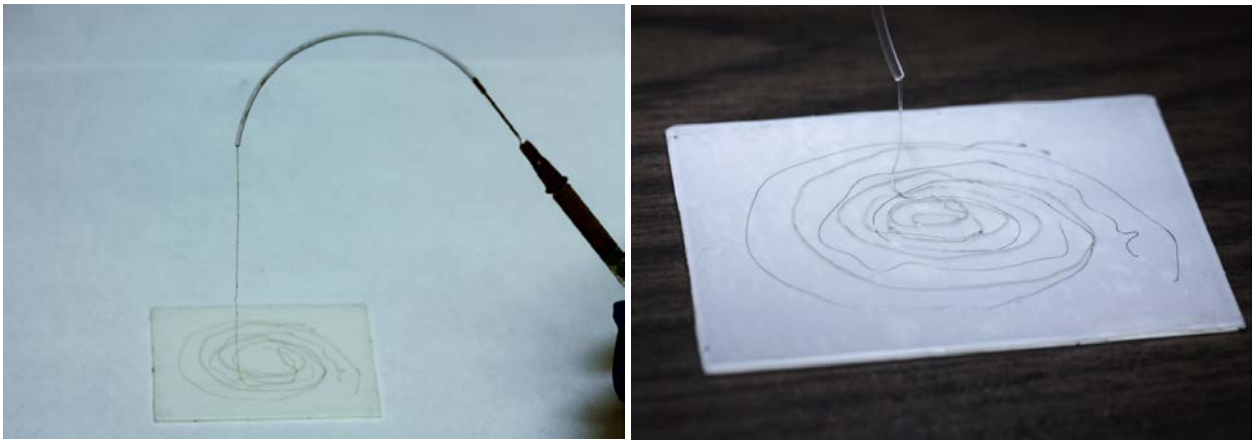

Fig. S1. Extrusion of the GO-loaded agarose gel.

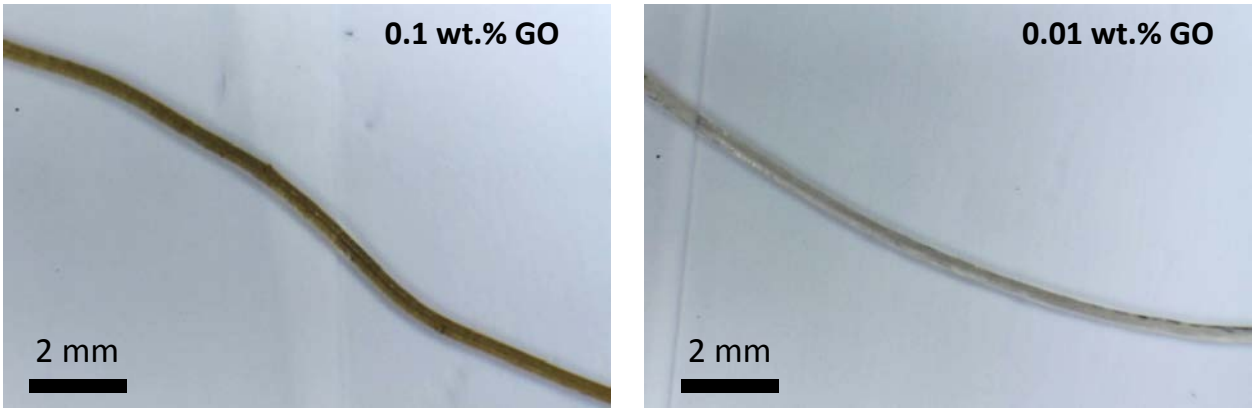

Fig. S2. Low magnification optical images of A/GO composite wires of the samples (a) and (b) in Fig. 2.

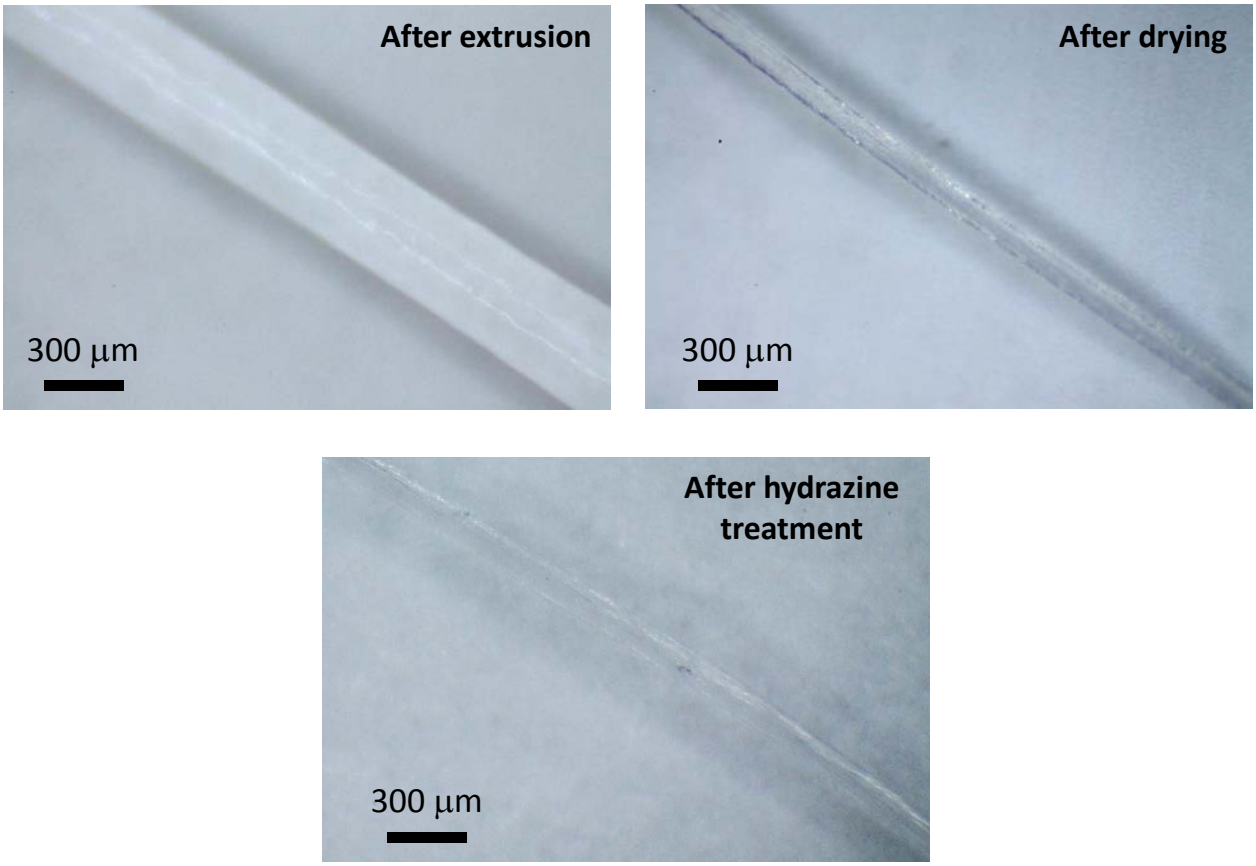

Fig. S3. Optical images of GO-free agarose wires. The agarose content is 2 wt.% before drying.

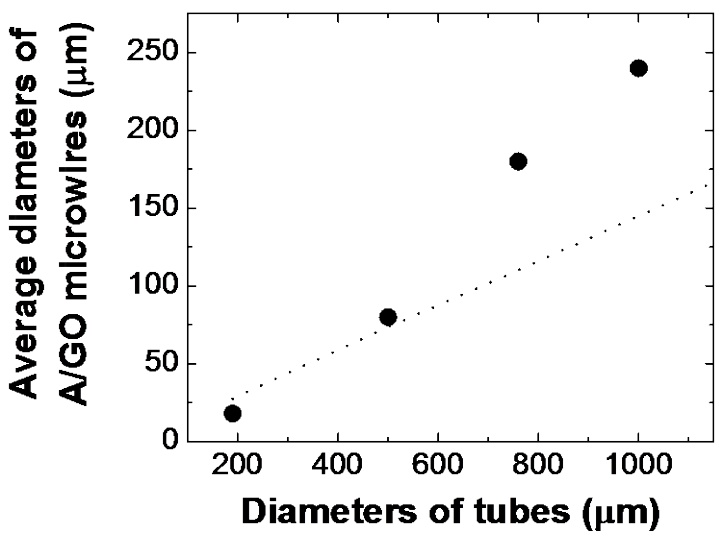

Fig. S4. A/GO microwire diameter as a function of the extrusion tube inner diameter. Dotted line is the calculated diameter assuming only radial contraction when water is evaporated.

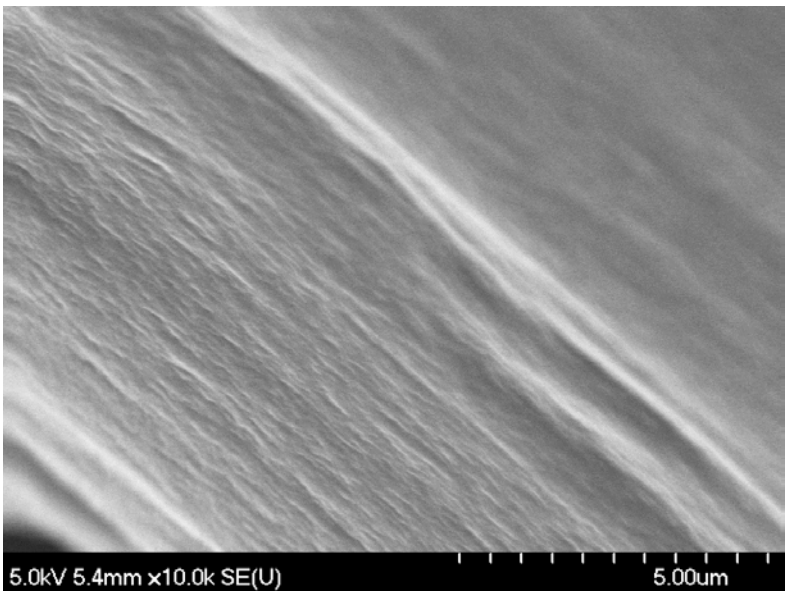

Fig. S5. SEM image of A/rGO composite wires prepared from A/GO hydrogel containing 0.1 wt.% GO.

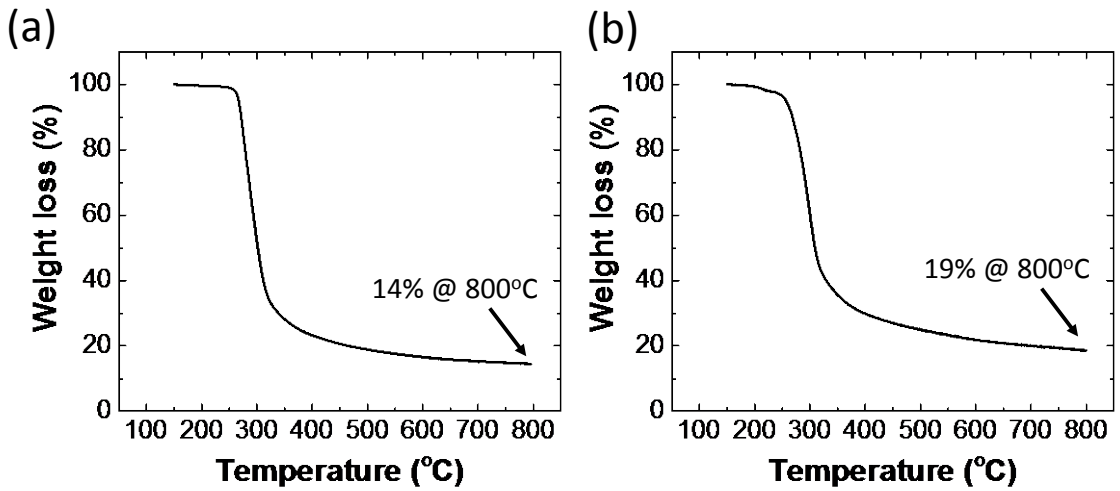

Fig. S6. TGA curves of (a) agarose and (b) dried A/rGO (2 wt.% of agarose and 0.1 wt.% of graphene oxide before drying of 97.9wt.% of water). The TGA measurement was conducted in air at a heating rate of 10 ^{o}C/min. The residual weight is 5% higher in (b) than (a), which is because of the thermally stable rGO (weight percent of rGO in the dried A/rGO composite is 0.1 wt.%/2.1 wt.% ≈ 5 wt.%).

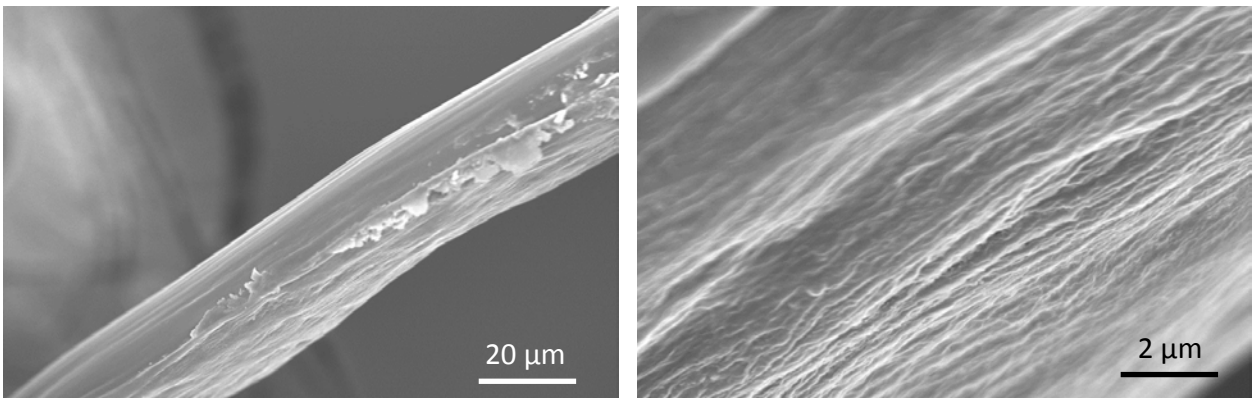

Fig. S7. SEM images of A/rGO composite wires after 400 °C heat treatment.

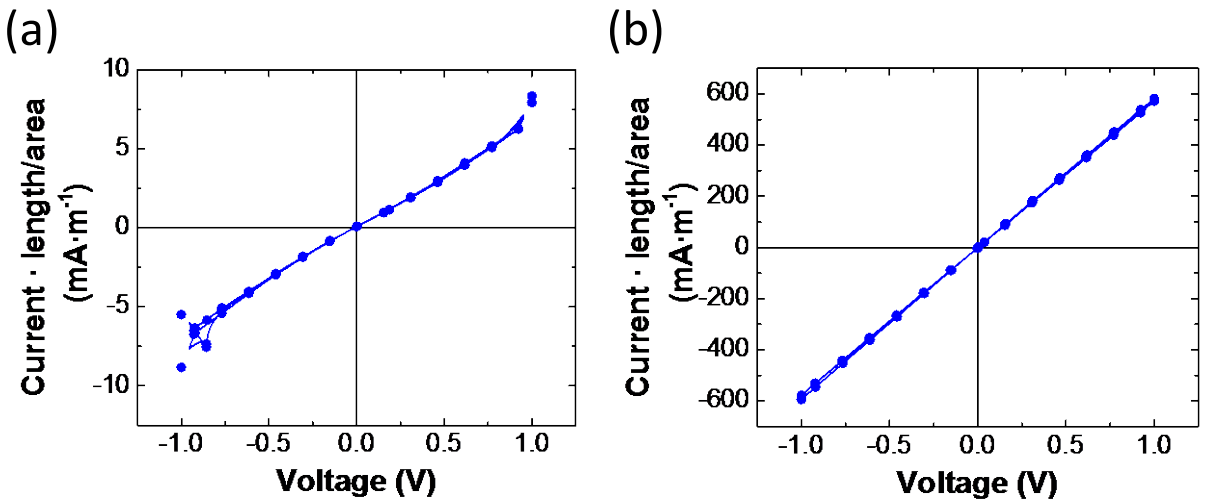

Fig. S8. I-V curves of A/rGO microwire after the thermal treatment at (a) 200 °C and (b) 300 °C.