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Decoration of Crumpled rGO Sheets with Ag Nanoparticles by Spray Pyrolysis

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Abstract

In this work, crumpled reduced graphene oxide (rGO) nanostructures were produced using spray pyrolysis technique. Graphite oxide (GtO) prepared through a modified Hummers method was used as starting material. Water dispersions of graphene oxide (GO) were prepared and sprayed in a tube furnace at 300 °C, 500 °C and 700 °C using Argon (Ar) as carrier gas. Also, precursor dispersions with different AgNO₃ concentrations were processed at the same conditions. During the treatment, the sprayed droplets underwent rapid heating and then gradual cooling until the exit of the oven, where crumpled rGO and Ag/rGO powders were collected. The prepared materials were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), Raman and FT-IR spectroscopy. It was established that the crumpling of the nanosheets was slightly

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