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Magnetic graphene oxide-polystyrene and magnetic activated carbon-polystyrene nanocomposites as sorbents for bisphenol A.

Kyriazis Rekos (1), Zoi Christina Kampouraki (1), Victoria Samanidou (2), and Eleni Deliyanni (1)

(1) Laboratory of General & Inorganic Chemical Technology, Department of Chemistry,Aristotle University of Thessaloniki,Thessaloniki, Greece (lenadj@chem.auth.gr), (2) Laboratory of Analytical Chemistry, Department of Chemistry, Aristotle University of Thessaloniki, GR-541 24 Thessaloniki, Greece

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Kyriazis Rekos1, Zoi Christina Kampouraki1, Victoria Samanidou2, Eleni Deliyanni1
1 Laboratory of General and Inorganic Chemical Technology, Department of Chemistry, Aristotle University of Thessaloniki, GR-541 24 Thessaloniki, Greece
2 Laboratory of Analytical Chemistry, Department of Chemistry, Aristotle University of Thessaloniki, GR-541 24 Thessaloniki, Greece

The aim of this work was to prepare and characterize novel composites of magnetic activated carbon or magnetic graphene oxide with polystyrene (GO/PSm), through one step simple and effective route. agnetite nanoparticles, prepared in the laboratory, were dispersed in the presence of activated carbon (C) or graphene oxide (GO) in a polystyrene (PS) solution in dimethylformamide, at elevated temperature, for the fabrication of the magnetite-Carbon-PS (C-PSm) and magnetite- Graphene Oxide-PS (GO-PSm) hybrid-nanoparticles. For comparison, C-PS and GO-PS composites were also prepared in the same route. The nanocomposites were tested for their sorption ability for an endocrine disruptor, bisphenol A. The effect of solution pH, initial concentration, contact time and temperature were examined. The magnetic graphite oxide-polystyrene presented higher adsorption capacity (100 mg/g) than the non magnetic composites (70 mg/g), as well as than initial graphite oxide (20 mg/g). FTIR, XRD, BET, TGA, VSM and SEM were performed in order to investigate the role of the PS on the better adsorption performance of the mGO-PS nanocomposites. The characterization with these techniques revealed the possible interactions of the surface functional groups of activated carbon and/or graphite oxide with polystyrene that resulted in the better performance of the magnetic nanocomposites for bisphenol A adsorption.