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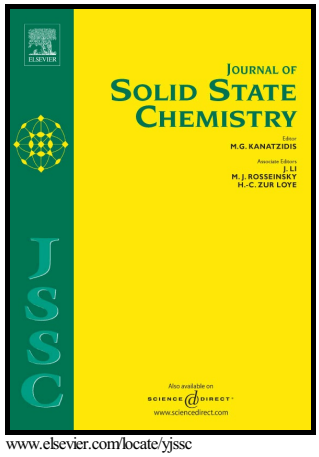

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Preparation of zeolite imidazolate framework/graphene hybrid aerogels and their application as highly efficient adsorbent

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Abstract:

Zeolite imidazolate framework/graphene aerogels (ZIF/GAs) were synthesized via a counter diffusion method for wastewater purification. XRD, FTIR, Raman, XPS spectroscopy, and FESEM technique were applied to characterize the structure and morphology of the aerogels, and the results confirmed that the ZIF/GAs exhibited a 3D interconnected macroporous framework of graphene sheets with uniform dispersion of ZIF particles. The adsorption performance of the as-prepared ZIF-67/GA and ZIF-8/GA was investigated by adsorbing dyes. The adsorption capacities showed that the ZIF-67/GA had higher adsorption efficiency than the ZIF-8/GA and pristine graphene aerogels towards dyes. The adsorption ability of the ZIF/GAs towards anionic MO dye was relatively larger than that of cationic RhB dye, ascribed to the different electrostatic attraction and π-π interaction of ZIF/GAs to dyes. The adsorption kinetics of the ZIF/GAs towards dyes were studied as well. As such, the prepared ZIF/GAs composites are the perfect candidates

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