

Syntheses of Mesoporous Silica Functionalized with Thiol Groups/Sulfonic Acid Groups as Adsorbent

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Mesoporous silica has been functionalized with thiol groups(MS-TG) by means of a simple synthesis approach involving co-condensation of tetraethoxysilane(TEOS) and mercaptopropyltrimethoxysilane(MPTMS). And Mesoporous silica containing sulfon acid groups(MS-SAG) was also synthesized through the oxidation process of MS-TG. These two materials were characterized by FT-IR, TGA, and nitrogen adsorption measurement(BET). FT-IR spectra showed that mesoporous silica was incorporated with functional groups well. The results of TGA and BET indicated that two materials have good thermal stability and high surface area. The removal of Cu(II) and Pb(II) ions from aqueous solutions was studied by batch method. The effect of initial pH, contact time were investigated. The synthesized materials exhibited good adsorption potential for copper and lead ions. MS-SAG showed higher adsorption capacity than MS-TG. Adsorption reached equilibrium in 10 min for all cases and the pseudo-second-order model was the best choice as the kinetic model.