



New low-cost composite adsorbent synthesis and characterization

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ABSTRACT

In this research, a novel composite, poly(acrylamide-expanded perlite) [P(AAm-EP)], was synthesized and characterized. The chemical synthesis was achieved by using free-radical polymerization and a number of structural characterization methods, including Fourier-transformed infrared spectroscopy (FTIR), X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), Brunauer–Emmett–Teller (BET)-porosity, and swelling tests. Free-radical polymerization of acrylamide (AAm) over expanded perlite (EP) was successfully performed. The effect of reaction variables, such as dosage of the initiator, total concentration of the reactants, reactant ratio, mixing time, temperature, and reaction time, were investigated in detail. Expanded perlite was cross-linked with acrylamide to enhance its chemical resistance. P(AAm-EP) composite has a specific surface area of $31.7 \text{ m}^2 \text{ g}^{-1}$.

Keywords: Composite; Polyacrylamide; Chemical synthesis; Infrared spectroscopy; Expanded perlite

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