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Study of desorption oil from absorbent polymeric resin (DVB-MMA) by applying of the nanoemulsion based on Solbrax

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Adsorbent materials such as polymeric resins have been used in the treatment of oily water. The cleaning of these materials may reduce its disposal and increasing its useful life and efficiency of the overall process. This study observed the capacity of desorption of oil from a polymeric resin based on divinyl benzene and methyl methacrylate copolymer (MMA-DVB), by applying a nanoemulsion based on solvent (Solbrax). The average pore diameter of the resin was about 50 nm. The nanoemulsion of oil (Solbrax) / nonionic surfactant-based polyoxide / brine was obtained in a high pressure homogenizer (HPH) and characterized according to their size drops in equipment Zetasizer Nano ZS. The size distribution curve showed that the nanoemulsion had droplets size in the range between 7 and 20nm. Absorbent polymeric resin samples were impregnated with oil in centrifuge. The study of desorption oil from polymeric resin by applying of the nanoemulsion was carried out in shaker bath at a constant temperature of 24 °C. The profile of oil desorption versus time was obtained from the absorbance reading in UV equipment for oil contained in the nanoemulsion. A kinetic study to profile desorption showed that this was best represented by second-order kinetics model and the intraparticle diffusion is not the limiting step of the process. This study also showed that the nanoemulsion has a high removal efficiency of oil adsorbed on porous surfaces with average pore diameter of about 50 nm, since the equilibrium concentration represented more than 80% by weight of oil adsorbed on the resin.

Biography

Claudia R. E. Mansur holds a BS degree in chemical engineering (1991), an MSc (1995) and Ph.D. (2002) in science and technology of polymers from Federal University of Rio de Janeiro (UFRJ), Brazil. Currently, Mansur is Assistant Professor at Macromolecules Institute of UFRJ. She has authored 40 articles published in reputed journals. She has advised fourteen students in their master's dissertations and one in his doctor´s theses.

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