

Separation of oil water emulsions using microfiltration membranes with a surface layer of polyaniline

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Abstract

Water-oil emulsions containing mostly oil and surfactants formed by the use of cutting fluids (coolant) in the metal, as well as oil production plants. Membrane techniques are often used to clean the oil water emulsions. But high concentrations of oil result in reduction of membrane performance. For membranes with high performance and the degree of purification is carried out modification of the membrane. In this paper we prepared composite membranes with the modified polyaniline surface layer on a substrate of nylon, cellulose acetate and PTFE. The results of the study of membranes by IR-spectroscopy of the molecular structure of polyaniline and some materials on its basis. Determined moisture content, specific productivity and the degree of purification of oil water emulsions of oil products for the original and modified membranes. An analysis of the infrared absorption spectra of the original and the modified membranes showed the presence of polyaniline matrix in the modified membranes. After modifying polyaniline an increase in the degree of purification of oil water emulsions of oil. The specific membrane performance after modification significantly reduced. The most optimal for specific performance (14.2 cm³ / cm² · min) and purity (96.5%) of petroleum products is a membrane modified polyaniline membrane of cellulose acetate grade AC-PANI.

Keywords

Cellulose acetate, IR-spectroscopy, Membrane, Nylon, Oil, Oil-water emulsion, Polyaniline, Polytetrafluoroethylene