

Surface Modified Electrospun Expanded Polystyrene Fibre with Superhydrophobic/Superoleophilic Properties as Potential Oil Membrane

Authors : S. Oluwagbemiga Alayande, E. Olugbenga Dare, Titus A. M. Msagati, A. Kehinde Akinlabi , P. O. Aiyedun

Abstract : This paper presents a cheap route procedure for the preparation of a potential oil membrane with superhydrophobic /superoleophilic properties for selective removal of crude oil from water. In these study, expanded polystyrene (EPS) was electrospun to produce beaded fibers in which zeolite was introduced to the polymer matrix in order to impart rough surface to non-beaded fiber. Films of the EPS and EPS/Zeolite solutions were also made for comparative study. The electrospun fibers EPS, EPS/Zeolite and resultant films were characterized using SEM, BET, FTIR and optical contact angle. The fibers exhibited superhydrophobic and superoleophilic wetting properties with water and crude oil. The selective removal of crude oil presents new opportunity for the re-use of EPS as adsorbent in petroleum/petrochemical industry.

Keywords : expanded polystyrene, superhydrophobic, superoleophilic, oil-membrane

Conference Title : ICEBWE 2014 : International Conference on Energy, Biomass and Waste Engineering

Conference Location : Cape Town, South Africa

Conference Dates : November 06-07, 2014