



Preparation and characterization of a new kind of UV-grafted ion-recognition membrane

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ABSTRACT

A new kind of alkali metal ion-recognized membrane material compound named poly (styrene-co-allyl oxygen)-4-tert butyl-calix [4] arene was synthesized by 4-tert-butyl calyx [4] arene and poly(styrene-co-allyl alcohol) as raw materials. Then a new ion recognition functional membrane was prepared by UV irradiation method via grafting the compound onto the surface of polyacrylonitrile (PAN) micro porous membrane. ATR-FTIR, SEM, AFM and SPM were used to test the surface structure of the functional membrane. The results showed that the functional membrane could form spindle structure on the surface of PAN membrane by the self-assembly way. Control transport experiment for non-functional material (PAA) grafted membrane and functional material grafted membrane were tested in our work, and the data showed that the functional material grafted membrane was able to identify Li⁺, Na⁺ and K⁺ while the PAA grafted membrane have not the ion-recognition ability. The recognition sequence of the functional membrane was K⁺>>Na⁺>Li⁺.

Keywords: UV grafting, Ion-recognition, Calix [4] arene, function membrane, ion transport, PAN membrane

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