

The formation mechanisms of polymeric membranes by phase separation

Gabriela CIOBANU^{a*}, Gabriela CARJA^a, Maria HARJA^a and Lacramioara ISTRATI^b

^a*Faculty of Chemical Engineering, "Gh. Asachi" Technical University of Iasi, D. Mangeron 71 A Blvd., Iasi, 700050, Romania*

^b*Faculty of Engineering, University of Bacau, Calea Marasesti 157, Bacau, 600115, Romania*

Abstract Polymer based membranes have been used in a large number of separation processes. The properties of a membrane depend in a large part on its microstructure, which is controlled by elaboration process. A dense homogeneous film is obtained by solvent evaporation of the polymer solution in a dry atmosphere. An asymmetric membrane with porous structure is prepared by immersion in a coagulation bath. This work investigated the preparation of polyurethane and cellulose acetate membranes by phase separation. We systematically study the formation of membrane when a thin cast layer of the polymer solution is transformed into protomembrane after its immersion into coagulation bath which in general mostly consists of non-solvent for polymer. The SEM images of the cellulose acetate or polyurethane membranes evidence the asymmetry / heterogeneity of these systems.

Keywords: polymeric membranes, membrane preparation, phase separation.
