

ABSTRACT

**POLYSULFONE HOLLOW FIBER GAS SEPARATION
MEMBRANES WITH IMPROVED PERMSELECTIVITY**

Formulation of a polymer dope and a method for preparing high separation
5 performance polymeric membranes for gas and vapor separation are disclosed. The
formulated polymer dopes contain a polymer, such as polysulfone, a solvent and a
nonsolvent-additive. The nonsolvent-additives include water, C₁-C₃ aliphatic alcohols or
mixtures of one of the alcohols and water. The dopes were tailored to be very close to the
incipient phase separation upon the addition of a sufficient amount of the nonsolvent-
10 additive, and have a moderate polymer concentration and viscosity. Asymmetric hollow
fiber membranes were fabricated by the dry/wet phase inversion process. The dried hollow
fibers were then coated with a highly permeable material. The resulting membranes
exhibited high gas fluxes and selectivities, and could be used to separate oxygen and
nitrogen; hydrogen from nitrogen or methane; carbon dioxide from methane; and other
15 common gas pairs.

(Figure 1 is to be published)