

# **PREPARATION OF MISCIBLE POLYMER BLENDS FOR USING AS MEMBRANES FOR SELECTIVE SEPARATION OF VOLATILE ORGANIC COMPOUNDS FROM THEIR MIXTURES BY EVAPORATION TECHNIQUE**

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## **ABSTRACT**

The miscibility study of poly(vinylchloride)/Poly(ethylene oxide) blends (PVC/PEO) was studied by XRD, FT-IR and DSC methods at different compositions. This investigation revealed that the system was completely miscible in all proportions. The FT-IR study revealed that the miscibility of this pair of polymers was due to the presence of hydrogen bond between the acidic proton of vinyl chloride (VC) units in PVC and the oxygen of ethylene oxide (EO) units in PEO. The study by DSC method revealed the miscibility of this system by the presence of one glass transition temperature ( $T_g$ ) of each PVC/PEO composition between those of the neat polymers and by interaction parameter determined using Kwei and Scneider approaches. The results obtained by the same technique revealed that the crystalline growths of PEO were dramatically affected by the addition of PVC content and the PVC was uniformly distributed in the PEO matrix. The non isothermal kinetic study on this pair of polymers indicated that the Ozawa model described perfectly the crystallization behavior of PVC/PEO blend. The  $T_g$ ,  $T_m$  and  $T_c$  was found not significantly influenced by the introduction of carbon nanotube (CNT) in the PVC/PEO polymer matrix using in this work to increase the absorbability of organic compounds. From this finding it can be conclude that the raw material synthesized can be used as polymer membrane due to its homogeneity and mechanical properties. The hydrophilic-hydrophobic character of this membrane can be controlled easily by the modification of PVC/PEO composition. In the future, this material will be used to extract alcohol, ketones, aldehydes and carboxylic acid from their mixtures.