Preparation And Characterization Of Conducting Polymer Based Composite Membranes

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Conducting polymers such as polyaniline, polypyrrole, polythiophene and related polymers have attracted considerable attention in recent years to produce new functional materials. For example, these polymers have been used to produce rechargeable batteries, sensors, corrosion inhibitor, ion-exchange materials etc. [1].

Due to the ion-exchange and redox properties, the polyaniline and its derivatives are frequently used in separation science as membranes, supported films and surface layers for application ranging from gas separation, electrodialysis and donnan dialysis [2].

In this study, poly(2-chloroaniline) and poly(2-fluoroaniline)/PVDF (Polyvinylidene difluoride) composite membranes were prepared by casting method [3]. Poly(2-chloroaniline) and poly(2-fluoroaniline) were synthesized chemically using (NH₄)₂S₂O₈ as oxidant. Two different dopants were used such as sodium dodecyl sulfate (SDS) and o-aminobenzen sulfonic acid (ABS) and the effect of dopant on the morphology of composite membranes has been investigated. Dimethyl formamide (DMF) and Methanol were used for dissociation of polymers. The morphology of the composite membranes was investigated by scanning electron microscopy (SEM), atomic force microscopy (AFM) and FTIR-ATR. In addition, it was found that ion-exchange membrane properties of the composite membranes and determined ion-exchange capacity with neutralization titrations.

References

