Preparation and characterization of polyethersulfone membranes via reverse thermally induced phase separation (RTIPS) method

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In RTIPS method, a homogeneous polymer solution is obtained at room temperature and subsequently immersed in a water bath at a temperature higher than low critical solution temperature (LCST) to form a membrane; phase separation is induced by rapidly heating the polymer solution to a LCST. The RTIPS method involves both a low membrane-forming temperature (similar to that used in non-solvent induced phase separation) and a rapid heat transfer (similar to that used in thermally induced phase separation). The advantage of the RTIPS process is the easy preparation of membranes with symmetrical bi-continuous morphology resulting in good mechanical properties. [1]

In this work, different PES membranes with bi-continuous structure were acquired from RTIPS process, such as PES membranes and PES/TiO_2 hybrid membranes. These membranes prepared by RTIPS showed good permeation and mechanical properties. [2,3]

The development of the PES membranes prepared by RTIPS processes generates less pollution and is a low cost process, making it suitable for industrialization.

Keywords: polyethersulfone, membrane, reverse thermally induced phase separation

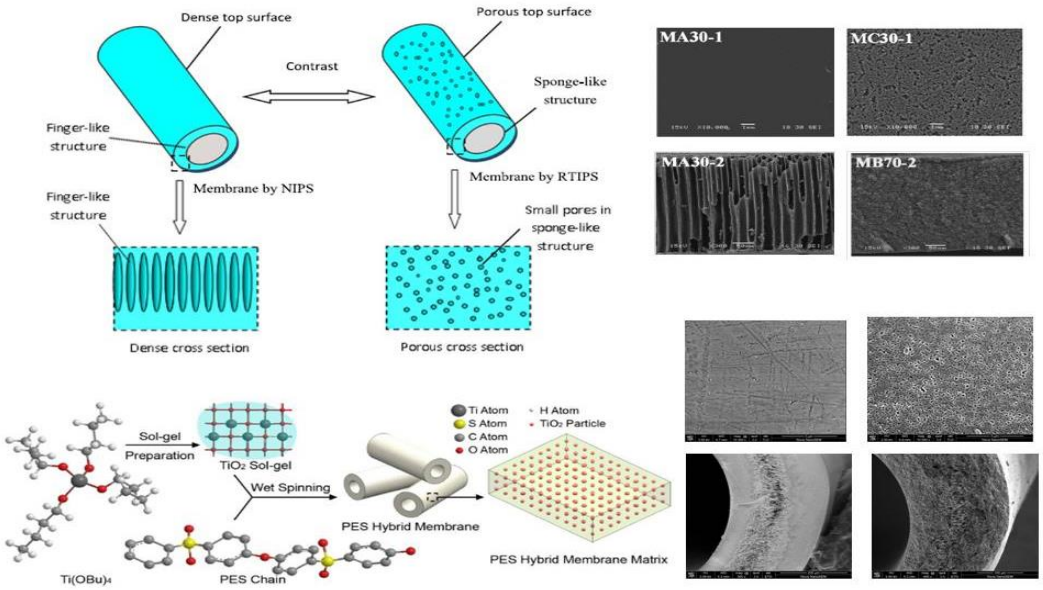

Figure 1: The contrast of the membranes prepared by NIPS and RTIPS method; SEM micrographs of PES membranes and PES/TiO_2 hybrid membranes

References

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