

Pore fabrication in crystalline polymer film by organic solvent and water-pressure for application to water-treatment

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We report a facile method of fabricating pores in crystalline polymers by organic solvent and water-pressure. After the polyacrylonitrile (PAN) free standing films as crystalline polymers was dipped into organic solvents, the PAN film was exposed to water-pressure. After the water-pressure was applied on PAN film, some pores were generated in polymer, with the sizes of 2.5 μm for smaller and an average of 10 μm for relatively bigger cases with porosity of 6.1%. These results were attributable to the weakening of the intermolecular chain interaction in amorphous regions when the PAN film was exposed to organic solvents, which resulted in the pore generation when exposed to water-pressure. The fabricated pores were demonstrated by scanning electron microscopy (SEM) and porosimeter.