

عنوان مقاله:

The effect of linear low density polyethylene (LLDPE) molecular weight on the property of microporous membrane formation via thermally induced phase separation

محل انتشار:

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خلاصه مقاله:

Polymeric membranes have been developed for a variety of industrial applications. Each application imposes specific requirements on the membrane material and membrane structure. In this work microporous linear low density polyethylene (LLDPE) has been prepared via thermally induced phase separation. A homogeneous solution was prepared by melt-blending of two different types of LLDPEs with liquid paraffin. The effect of melt flow index of LLDPE which is attributed to polymer molecular weight, on the porosity and mechanical strength of porous structure was investigated. To the best of our knowledge, this is the first report about the effect of LLDPE molecular weight on membrane porosity in membrane formation via phase separation method. In the specific concentrations of polymers to diluents ratio, increasing the MFI, led to the decrease of mechanical strength and increase of porosity. The results of porosity measurements and tensile analysis showed that LLDPE with MFI=2(LLDPE 220) has bigger pores than LLDPE with MFI=0.9(LLDPE 209). Droplet growth rate depends on the matrix phase viscosity. High MFI, means low molecular weight was caused to low viscosity. Low viscosity in LLDPE 220 system could allow a faster droplet growth than the LLDPE 209 system. As a consequence, lower viscosity contributes to the LLDPE 220 sample having larger pores than the LLDPE 209 sample.

کلمات کلیدی:

Polymeric membrane, Melting flow index, Phase separation, Linear low density polyethylene

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