عنوان مقاله:

A Classical Investigation on Effect of Zeolite 4A nanoparticles on Equilibrium Thermodynamic of Polymeric solutions and Morphology of Resulting Membranes

محل انتشار:

پنجمین کنفرانس بین المللی پژوهش کاربردی در شیمی و مهندسی شیمی با تاکید بر فناوری های بومی ایران (سال: 1397)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

thermodynamic behavior (binodal curve) of polymeric solutions (containing n-methyl pyrolidone (NMP) and polyether sulfone (PES)) and morphology of resulting membranes were studied classicaly. To improve the distribution and adhesion of nanoparticles in casting solutions, mechanical surface modification, using ball mill and chemical surface modification, using APTES silane agents, were applied. Cloud point results showed that the water-solubility and thermodynamic stability of polymeric solutions decreases as surface modified nanoparticles content increases in the dopes. To investigate the effect of nanoparticles on membrane morphology, mixed matrix membranes (MMMs)containing the modified nanoparticles were fabricated by wet phase inversion technique and analyzed by SEM experiment. SEM results showed, all fabricated membranes are asymmetric and skin layer of the MMMs containing surface modified nanoparticles are generally thinner than that of neat PES membrane which is in accordance with binodal curves phase behavior. This phenomenon can be attributed to instantaneous demixing, .caused by thermodynamic unstability of polymeric solutions containing modified nanoparticles

کلمات کلیدی:

membrane, phase inversion, zeolite 4a, binodal curves