عنوان مقاله:

In-situ formation of FeOOH nanoparticles as filler in preparation of ion-exchange nanocomposite membrane

محل انتشار:

نهمین سمینار ملی شیمی و محیط زیست ایران (سال: 1398)

تعداد صفحات اصل مقاله: 1

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خلاصه مقاله:

Ion-exchange membranes are one of the most advanced membranes, which have been used in various industrial separation processes. In this study, a simple one-step chemical method was used to prepare a new type of cation-exchange nanocomposite membranes by in-situ formation of FeOOH nanoparticles in a blend containing sulfonated poly (2,6-dimethyl-1,4-phenylene oxide) and sulfonated polyvinylchloride. Prepared nanocomposite membranes were characterized using scanning electron microscopy, Fourier transform infrared spectroscopy and X-ray diffraction. The SEM images showed that FeOOH nanoparticles were uniformly dispersed throughout the polymeric matrices. The effect of additive loading on physicochemical and electrochemical properties of prepared cation-exchange nanocomposite membranes was studied. Various characterizations showed that the incorporation of different amounts of FeOOH nanoparticles into the basic membrane structure had a significant influence on the membrane performance and could improve the electrochemical properties. Furthermore, all modified membranes containing nanoparticles exhibited lower specific electrical resistance compared to pristine membrane. This work introduces the cation-exchange nanocomposite membrane containing 3 wt% additive loading, with suitable IEC, FIC, transport number, permselectivity, ionic flux, permeability, current efficiency, oxidative stability and low specific electrical resistance as a new superior and applicable membrane.

کلمات کلیدی: