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论文

水、甲醇和乙醇溶剂在PVA膜材料中无限稀释扩散系数测定

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摘要:

用气相色谱法研究小分子溶剂与聚合物材料之间的相互作用是一种快速、准确和方便的方法,该方法可以测量多种小分子溶剂在聚合物中的溶解和扩散行为.采用该方法测定了水、甲醇、乙醇在固定液PVA中的保留时间和半峰宽,运用van Deemter模型进行数据处理,得到了上述几种小分子在PVA膜材料中的无限稀释扩散系数,获得了有意义的结果.

关键词: 气相色谱; 水; 甲醇; 乙醇; PVA; 扩散系数

Measurement of Diffusion Coefficients of Water, Methanol and Ethanol Solvents at Infinite Dilution in the PVA Membrane Material

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Abstract:

Gas chromatography is a new, fast, accurate and convenient technique for studying the relationship between small molecule solvents and polymer membrane materials. Many parameters of dissolution and diffusing characters of a small molecule in a polymer can be measured by this method. The retention time and the peak widths at half-height of water, methanol and ethanol in the stationary phase of PVA were obtained in this work. The diffusion coefficients of the small molecule solvents at infinite dilution were calculated with van Deemter equation. The graphs plotted according to the results of the diffusion coefficients of the three small molecule solvents at infinite dilution vs. temperatures were in agreement with the Arrhenius equation. The variance in the diffusion coefficients at infinite dilution of three small molecule solvents was analyzed according to the differences in molecular size.

Keywords: Gas chromatography; Water; Methanol; Ethanol; PVA; Diffusion coefficient

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