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论文

聚丙烯酰胺对烷基苯磺酸盐界面吸附膜扩张流变性质的影响

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摘要:

采用小幅低频振荡和界面张力弛豫技术, 研究了部分水解聚丙烯酰胺(Mo-4000)和阴离子表面活性剂2-丙基-4,5-二庚基苯磺酸钠(377)体系在癸烷/水界面上的扩张黏弹性质, 并考察了电解质对体系界面流变性质的影响. 研究发现, 低表面活性剂浓度时, 聚合物的加入大大降低了扩张模量; 而高表面活性剂浓度时, 聚合物的存在导致了界面膜更接近弹性膜. 一方面电解质压缩双电层, 增加界面膜的紧密程度, 造成高频条件下扩张模量增大; 另一方面, 电解质增强表面活性剂分子在界面与体相间的扩散交换作用, 增大了扩张模量的频率依赖性, 造成低频条件下扩张模量降低.

关键词: 扩张流变; 部分水解聚丙烯酰胺; 烷基苯磺酸盐; 电解质溶液

Effect of Partly Hydrolyzed Polyacrylamide on the Interfacial Dilational Properties of Alkyl Benzene Sulfonate

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Abstract:

The dilational viscoelastic properties of partly hydrolyzed polyacrylamide and alkyl benzene sulfonate in the absence or presence of electrolyte were investigated at the decane water interface by means of longitudinal method and the interfacial tension relaxation method. At low surfactant concentration, the addition of polymer could sharply decrease the dilational elasticity, while it may enhance the dilational elasticity at higher surfactant concentration. Addition of electrolyte possibly compresses the double layer, which leads to a higher dilational elasticity. On the other hand, it also possibly speeds up molecular exchange between the bulk and interface, which results in decreasing the dilational elasticity at low frequency.

Keywords: Dilational rheology; Partly hydrolyzed polyacrylamide; Alkyl benzene sulfonate; Electrolyte solution

收稿日期 2009-03-27 修回日期 网络版发布日期

DOI:

基金项目:

国家科技重大专项项目(批准号: 2008ZX05011)资助.

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