

研究论文

聚硼酸酯表面活性剂囊泡自发形成

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摘要 通过直接引发聚合, 以偶氮二异丁腈为引发剂, 用*N*-羟甲基丙烯酰胺、硼酸三乙酯和*N,N*-二羟乙基十二烷基胺制备了聚硼酸酯(PMBE)表面活性剂, 用红外光谱、核磁共振谱和凝胶色谱对其结构进行了表征; 用透射电镜(TEM)研究了PMBE在纯水和0.1 mol/L NaCl水溶液中的自组装形态. 结果表明, PMBE在水和0.1 mol/L NaCl溶液中皆可自发形成聚合囊泡; 在水溶液中PMBE囊泡粒径约为20 nm, 而在NaCl溶液中囊泡直径增大, 在150~250 nm之间, 分布较为均匀; 结合两性性分子排列参数理论和一定的近似处理方法对PMBE聚合囊泡的形成机理进行了初步探讨.

关键词 [囊泡](#) [聚硼酸酯表面活性剂](#) [排列参数](#)

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Spontaneous Vesicle Formation of Polymeric Borate Ester Surfactant

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Abstract Using azobis(*iso*-butyro) nitrile(AIBN) as the initiator, a novel vesicle from polymeric borate ester(PMBE)surfactant was prepared by direct polymerization of *N*-hydroxymethyl acrylamide, triethyl borate and *N,N*-dihydroxyethyl dodecylamine. The PMBE was characterized by FTIR, ¹H NMR and GPC. The self-aggregate morphologies of PMBE in pure water and 0.1 mol/L NaCl solution were observed by TEM. The results show that the vesicle was formed spontaneously from PMBE both in water and NaCl aqueous solution. The diameter of PMBE vesicle is about 20 nm in pure water. In 0.1 mol/L NaCl solution, the diameter increases to the range from 150 nm to 250 nm. The mechanism of PMBE vesicle formation was discussed preliminarily by packing parameter theory of amphiphilic molecules and approximate processing method.

Key words [Vesicle](#) [Polymeric borate ester surfactant](#) [Packing parameter](#)

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