

材料工程专栏

Microstructure and Phase Behavior of Cationic Gemini/Anionic Polyelectrolyte/Water Ternary System

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 The microstructure of cationic gemini surfactant 1,6-bis(dodecyldimethylammonium) hexane dibromide [C₁₂H₂₅(CH₃)₂N-(CH₂)₆-N(CH₃)₂C₁₂H₂₅×2Br] (12-6-12×2Br-) and oppositely charged polyelectrolyte poly(acrylic acid, sodium salt) (NaPA) in aqueous solution has been studied by using fluorescence, conductivity measurement, freeze-etching and TEM. The data obtained from fluorescence and conductivity measurement show that micelle-like or complex can form between the gemini surfactant (12-6-12×2Br-) and polyelectrolyte NaPA due to the static electric interaction and hydrophobic forces. Through freeze-etching and TEM, the microstructure of the mixture solution has been studied, which is consistent with the result from micropolarity. Comparing the fluorescence spectrum of system of dodecyltrimethylammonium bromide (DTAB) and NaPA with that of system of gemini surfactant (12-6-12×2Br-) and NaPA, it can be found that the interaction between gemini surfactant (12-6-12×2Br-) and NaPA is stronger than that between DTAB and NaPA. And the phase behavior of (12-6-12×2Br-) and NaPA in aqueous solution has also been detected. It can be shown that the precipitate will transform into gel in higher NaPA concentration.

关键词 [gemini surfactant, polyelectrolyte, molecular interaction, micropolarity, micelle](#)

分类号

DOI:

对应的英文版文章: [206512](#)

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