

研究论文

季铵盐型Gemini表面活性剂的胶束化动力学研究

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收稿日期 2005-11-25 修回日期 网络版发布日期 2006-10-9 接受日期

摘要 采用停流法并结合Aniannson-Wall理论, 研究了联接基为 $(\text{CH}_2)_2$, $(\text{CH}_2)_3$, $(\text{CH}_2)_4$ 和 $(\text{CH}_2)_6$ 的季铵盐型Gemini表面活性剂胶束的形成-破坏过程. 动力学研究表明, 胶束形成-破坏过程的弛豫时间(τ_2)与联接基的长度、表面活性剂的浓度、反离子的浓度以及温度有关. 随联接基长度的增加, 季铵盐型Gemini表面活性剂胶束形成-破坏过程的弛豫时间缩短. 当温度高于293 K时, 随着反离子浓度的增加, $1/\tau_2$ 将出现一个最低值. 根据核化焓结果提出了不同的联接基长度的季铵盐型Gemini表面活性剂具有不同的胶束形成-破坏过程的机理.

关键词 [季铵盐型Gemini表面活性剂](#) [停流法](#) [弛豫时间](#)

分类号 [0648](#)

Kinetics of Micellization of Quaternary Ammonium Gemini Surfactants

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Abstract The stopped-flow technique combined with Aniannson-Wall theory was used to study the kinetics of micelle formation-breakup in aqueous solution of quaternary ammonium Gemini surfactant of the alkanediyl- α - ω -bis(dodecyldimethyl ammonium bromide) type with alkanediyl $=(\text{CH}_2)_2$, $(\text{CH}_2)_3$, $(\text{CH}_2)_4$ and $(\text{CH}_2)_6$. The kinetic results show that the relaxation time of micelle formation-breakup τ_2 is dependent on the spacer chain length, the concentration of the surfactants, the concentration of anti-ionic and the temperature. The quaternary ammonium Gemini surfactants show a decrease in relaxation time of micelle formation-breakup, as the spacer chain length is increased. Above 293 K, the $1/\tau_2$ comes to a minimum value when the concentration of anti-ionic is increased. The effect of nucleus formation enthalpy provides evidence in support of our proposed mechanism of the micelle formation-breakup for quaternary ammonium Gemini surfactant with different spacer chain lengths.

Key words [Quaternary ammonium Gemini surfactants](#) [Stopped-flow method](#) [Relaxation time](#)

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