

研究论文

盐引发阴离子/非离子表面活性剂复配体系中囊泡自发形成

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收稿日期 2005-10-2 修回日期 2005-12-26 网络版发布日期 2006-12-30 接受日期 2006-9-20

摘要 在无盐时, 阴离子表面活性剂十二烷基苯磺酸钠(SDBS)与非离子表面活性剂壬基酚聚氧乙烯(10)醚(TX-100)的复配体系中只有混合胶束存在, 而盐的加入即可以引发体系中囊泡的自发形成, 这使得囊泡的形成变得更加简单. 引发机理可以归因于盐对离子表面活性剂的极性头双电层的压缩作用, 减少了极性头的面积, 加上非离子表面活性剂的参与使得堆积参数 P 增加, 导致了半径更大的聚集体的形成. 制作了SDBS/TX-100/盐水拟三元相图, 通过目测和表面张力的变化确定了囊泡形成的带状区域, 并用负染色电镜(TEM)对囊泡进行了表征, 同时测定了盐度以及相同盐度下表面活性剂浓度对囊泡粒径的影响, 发现囊泡的粒径随着盐度的增加而增加, 而在同一盐度下, 囊泡的粒径基本不受表面活性剂浓度的影响.

关键词 [囊泡自发形成](#) [盐引发](#) [负染色电镜](#) [动态光散射](#) [单链阴离子表面活性剂/非离子表面活性剂复配](#)
分类号

Salt-Induced Spontaneous Vesicle Formation from Aqueous Mixture of Anionic/Nonionic Surfactants

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Abstract Without salt, only mixing micelles exist in aqueous mixture of anionic surfactant sodium dodecyl benzenesulfonate (SDBS) and nonionic surfactant octylphenoxypolyethoxyethanol (TX-100). However, the addition of salt induces the spontaneous formation of vesicle, which makes the formation of vesicle much easier and simpler. The mechanism of the formation may be attributed to the compression of salt on the electric bilayer of the surfactant head groups, which reduces their area and increases the packing parameter P of the surfactant under the participation of TX-100, resulting in the formation of larger aggregates. The vesicle region is presented in a pseudo-ternary diagram of SDBS/TX-100/brine by visual observation and surface tension measurement, which exhibits a strip-shape. The existence of vesicles is demonstrated by TEM image using negative-staining method. The variations of vesicle size with the salinity and the surfactant concentration are determined using dynamic light scattering method. It is found that the vesicle size is independent on the surfactant concentration, but subject to the salinity of the solution.

Key words [spontaneous vesicle formation](#) [salt inducement](#) [negative-staining TEM](#) [dynamic light scattering](#) [mixing of single-tailed anionic/nonionic surfactant](#)

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