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研究论文

两亲性壳聚糖衍生物的合成及其自聚集现象

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摘要 以壳聚糖为主链, 聚乙二醇单甲醚为亲水性链段, 癸二酸为疏水链段, 合成了一系列两亲性壳聚糖衍生物. 通过FTIR, ^{1}H NMR和X射线粉末衍射等手段对壳聚糖衍生物进行了结构表征, 由元素分析方法计算出衍生物的取代度. 采用直接溶解法制备了壳聚糖衍生物的空白胶束, 通过透射电子显微镜(TEM)观察了胶束的形态. 由动态光散射(DLS)测定了胶束的粒径及分布, 并以芘为分子探针, 通过荧光光谱法测定了壳聚糖衍生物的临界聚集浓度(CAC). 研究结果表明, 壳聚糖主链上疏水链段的取代度越大, 其衍生物的临界聚集浓度越低, 相同浓度下的胶束的粒径也越小.

关键词 两亲性壳聚糖衍生物 胶束 自聚集 临界聚集浓度(CAC)

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Synthesis of Amphiphilic Chitosan Derivatives and Their Self-aggregation Phenomenon

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Abstract A series of chitosan derivatives were synthesized via mPEG as hydrophilic group, sebacic acid as hydrophobic groups. Chitosan derivatives were characterized by FTIR, ^{1}H NMR and XRD. The degree of substitution(DS) was calculated by elemental analysis(EA). Chitosan derivatives were dissolved in double-distilled water to form micelles. The morphology of polymer micelles was measured by transmission electron microscopy(TEM), and the size and distribution of polymer micelles was determined by dynamic light scattering(DLS). The critical aggregation concentration(CAC) was detected by a fluorescence technique using pyrene as a probe. It was found that the CAC was decreased by increasing the DS of acyl group, meanwhile, the size of polymer micelles was decreased.

Key words Amphiphilic chitosan derivatives Micelles Self-aggregation Critical aggregation concentration

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