

研究论文

原位聚合法制备温敏性聚合物核壳胶束的响应温度调控及其负载行为

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摘要 采用原位聚合法成功地制备出聚乳酸/聚(异丙基丙烯酰胺-co-丙烯酰胺)[P(*D,L*-LA)/PNIPAM-co-AM]温敏性核壳胶束. 用SEM, TEM和AFM等方法表征了粒子的外在形貌和内部结构. DLS研究表明, 所得核壳粒子的尺寸具有温度敏感性, 通过改变单体的投料比, 可方便地调整胶束粒子的响应温度. 对胶束粒子的染料负载行为做了初步的研究.

关键词 [核壳结构](#) [高分子胶束](#) [聚异丙基丙烯酰胺](#) [大分子自组装](#)

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Adjustment of Responsive Temperature and Loading Behavior of Temperature-sensitive Core-shell Micelles Prepared via *in-situ* Polymerization

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Abstract *In-situ* polymerization, which had been developed in our group, was employed to prepare thermo-sensitive poly(*D,L*-lactic acid)/poly(*N*-isopropyl acrylamide-co-acrylamide)(PLA/PNIPAM-co-AM)core-shell micelles. The resultant micelles N_{100} , N_{90} and N_{80} were obtained in which the mass fractions of hydrophilic AM units in the feeds were 0, 10% and 20%, respectively. SEM, TEM and AFM were used to observe the morphologies of the micelles and the results confirmed the core-shell structure. The nanoparticles show a significant size change with the variation of temperature. The diameter of N_{100} decreases from 207.3 nm to 140.1 nm when temperature increases from 27 °C to 41 °C. The responsive temperatures of N_{100} , N_{90} and N_{80} were found to be 33, 41 and 56 °C, respectively, which means that the responsive temperature of the micelles can be adjusted by changing the shell compositions. In addition, the dye-loading behavior of the nanoparticles was also studied.

Key words [Core-shell structure](#) [Polymeric micelle](#) [Poly\(*N*-isopropyl acrylamide\)](#) [Macromolecular self-assembly](#)

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