

论文

温度及pH敏感的树枝状高分子衍生物合成及药物控制释放研究

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摘要 对合成的系列聚酰胺-胺型(PAMAM)树枝状高分子进行端基的羟基化和氯乙酰化两步修饰,使PAMAM最外层接上烷基氯.以修饰产物为引发剂,通过原子转移自由基引发甲基丙烯酸 N,N -二甲氨基乙酯(DMAEMA)聚合得到树枝状PAMAM高分子衍生物,并对其结构用FTIR、 $^1\text{H-NMR}$ 和粒径分析进行了表征.紫外可见分光光度计测定证实此高分子具有温度及pH敏感性.通过对小分子药物控制释放研究表明,此树枝状高分子衍生物通过环境pH值可有效地控制小分子药物的释放.

关键词 [聚酰胺-胺型树枝状高分子](#) [聚甲基丙烯酸 \$N,N\$ -二甲氨基乙酯](#) [树状高分子](#) [温度及pH敏感性](#) [药物控制释放体系](#)

分类号

SYNTHESIS AND CHARACTERIZATION OF THE THERMO-AND pH-SENSITIVE DENTRITIC POLYMERS BASED ON POLYAMIDOAMINE DENDRIMER AND POLY(N,N-DIMETHYLAMINOETHYL METHACRYLATE) AND STUDY ON THEIR CONTROLLED DRUG RELEASE BEHAVIOR

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Abstract Dendritic polymers which combine the temperature—and pH—sensitivities were synthesized. At first, polyamidoamine(PAMAM)dendrimers with generations 1 to 3 were synthesized by reaction of ethylenediamine with methyl acrylate, then polymers synthesized were acylated by chloroacetyl chloride to obtain PAMAM-Cl, which can act as a macroinitiator for further synthesizing functional polymers having both pH—and thermo—sensitivities. For fulfilling this goal, polymers with dendritic PAMAM as the core and different average length of poly(N,N-dimethylaminoethyl methacrylate)(PDMAEMA) were synthesized by atom transfer radical polymerization(ATRP). Their macromolecular structures were characterized by FTIR. $^1\text{H-NMR}$ and particle size analyses. Their aqueous solutions were studied by UV spectroscopy for understanding their thermo—and pH-sensitivities. The results showed that these dendritic polymers exhibit clearly thermo—and pH-respondings in accordance with the change of the environment. Using chlorambucil(CLB) as a model drug, the controlled drug release behavior of the polymers having different average length of PDMAEMA was studied. The results indicated that the rate of the drug release can be effectively controlled by pH values.

Key words [Polyamidoamine \(PAMAM\) dendrimers](#) [Poly \(N,N-dimethylaminoethyl methacrylate\)](#) [Dendritic polymer](#) [Thermo- and pH sensitivities](#) [Controlled drug delivery system](#)

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