

论文

海藻酸钠和聚 *N*-异丙基丙烯酰胺半互穿网络水凝胶的溶胀动力学研究

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收稿日期 2003-11-10 修回日期 2003-12-31 网络版发布日期 接受日期

摘要 以海藻酸钠 (SA) 和 *N*-异丙基丙烯酰胺 (NIPAM) 为原料, 制备出具有温度敏感性的半互穿网络水凝胶 (SA-PNIPAMsemi-IPN)。主要研究了海藻酸钠用量、水介质温度及 pH 值对该凝胶溶胀速率的影响。结果表明, 在 PNIPAM 最低临界溶解温度 (LCST) 以下, 该凝胶的溶胀速率随着凝胶网络中 SA 组分的增加而增大, 且溶胀速率取决于高分子链的松弛速率; pH 对凝胶溶胀速率的影响与温度有关, 温度对溶胀速率的影响与 pH 有关。

关键词 [海藻酸钠](#) [N-异丙基丙烯酰胺](#) [半互穿网络水凝胶](#) [溶胀速率](#)

分类号

STUDY ON THE SWELLING KINETIC OF SODIUM ALGINATE AND POLY(N-ISOPROPYLACRYLAMIDE) SEMI-INTERPENETRATING (SEMI-IPN) HYDROGEL

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Abstract The sodium alginate(SA)/poly(*N*-isopropylacrylamide) (PNIPAM) semi-interpenetrating (semi-IPN) hydrogel was prepared by incorporating SA into cross-linked PNIPAM to form a semi-IPN polymeric network. The properties of the semi-IPN hydrogel were characterized by DSC and SEM. The influences of the amount of SA in the semi-IPN hydrogel, pH and temperature on the swelling rates of these hydrogels have been thoroughly investigated. It is showed that at a temperature below the lower critical solution temperature (LCST) and pH=7.4 the swelling rate increases with increasing SA content in the semi-IPN hydrogel and relies on the relaxation rate of macromolecular chains in the hydrogel network. In addition, the effect of pH value on the swelling rate depends on temperature, while the effect of temperature on the swelling rate is also associated with pH value.

Key words [Sodium alginate](#) [N-isopropylacrylamide](#) [Semi-interpenetrating hydrogel network](#) [Swelling rate](#)

DOI:

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