

论文

## 化学交联聚乙烯醇(PVA)水凝胶的合成、表征及溶胀特性

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**摘要** 用环氧氯丙烷作交联剂, 制备了一种聚乙烯醇(PVA)水凝胶. 用FTIR和GPC方法对其结构作了表征. 在干凝胶中逐步加水使其溶胀, 通过差示扫描量热(DSC)方法测量溶胀水凝胶中不同状态水的含量变化来研究凝胶的溶胀特性. 结果表明, 当水进入干凝胶网络后首先与网络链上的亲水基团通过氢键的结合形成非冻结水, 非冻结水与干凝胶的比值为0.20. 非冻结水饱和之后, 额外再加入的水渗入网络空间, 同步形成冻结水与自由水两种状态直至达到平衡溶胀为止.

**关键词** [水凝胶](#) [表征](#) [差示扫描量热法](#) [溶胀](#)

分类号

## SYNTHESIS, CHARACTERIZATION AND SWELLING OF A CHEMICALLY CROSS-LINKED PVA HYDROGEL

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**Abstract** A poly(vinyl alcohol)hydrogel was prepared by coupling poly(vinyl alcohol)with epichlorohydrin as cross-linking agent. The structure of the hydrogel was characterized by FTIR and GPC techniques. Various amounts of water were added into the dry gel to swell it and the quantity of water in various states in the partially swollen hydrogel were determined by differential scanning calorimeter technique. The analytical results indicate that the water introduced into the dry gel first combines with the hydrophilic groups of the network chains through hydrogen bond forming non-freezable water. The ratio of the non-freezable water to dry gel in the hydrogels is about 0.20. After the non-freezable water is saturated, the additional water penetrates into the network space and forms simultaneously both in the freezable and free water states until reaching equilibrium swelling.

**Key words** [Hydrogel](#) [Characterization](#) [Differential scanning calorimeter](#) [Swelling](#)

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