

研究论文

## P(AA-DAC)两性聚电解质水凝胶的合成及性质

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**摘要** 以丙烯酸(AA)和丙烯酰氧乙基三甲基氯化铵(DAC)为单体, 采用水溶液聚合法制备了P(AA-DAC)聚电解质水凝胶. 采用红外光谱和核磁共振等方法对其结构进行了表征. 研究了不同组成比的聚电解质水凝胶在去离子水、不同pH值溶液以及不同离子强度盐溶液中的溶胀行为. 研究表明, 摩尔比为1:1的聚电解质水凝胶表现出典型的两性聚电解质凝胶的溶胀行为. 离子强度对其溶胀行为有着显著影响, 在溶液离子强度较高时, 凝胶网络的溶胀主要受溶剂向凝胶内部扩散所控制, 满足Fick型扩散规律 $n \leq 0.5$ , 随着溶液离子强度的增加, 凝胶网络平衡含水量增加, 扩散系数增大.

**关键词** [水凝胶](#) [两性聚电解质](#) [溶胀](#) [离子强度](#)

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### Preparation and Swelling Behaviour of Polyampholyte Hydrogels Composed of Acryloyloxyethyl-trimethyl Ammonium Chloride and Acrylic Acid

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**Abstract** A series of poly(acryloyloxyethyl trimethyl ammonium choride-co-acrylic acid) hydrogels were synthesized by solution polymerization and the structure of hydrogel was characterized by FTIR and NMR. Meanwhile, the swelling behavior of hydrogels in distilled water with vairous pH values and the salt solutions with different concentrations were investigated. The results show that the hydrogel with equal molar negative charges and positive charges presented an antipolyelectrolyte effect. Ionic strength drastically affected the swelling behavior of hydrogels. At the same time, the swelling kinetic parameters of swelling process of hydrogels were also calculated in salt solutions with different concentrations and the results illuminated that the first 60% swelling process of hydrogels was governed by Fickian diffusion mechanism ( $n \leq 0.5$ ) in the salt solution with a high ionic strength. With the increase of ionic strength, the swelling ratio of the hydrogels and diffusion coefficients increased.

**Key words** [Hydrogels](#); [Amphiphile](#); [Swelling](#); [Ionic strength](#)

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