

## 研究论文

### Fe<sub>3</sub>O<sub>4</sub>/PNIPAM纳米复合微球的制备研究

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**摘要:** 用化学共沉淀法制备Fe<sub>3</sub>O<sub>4</sub>磁性纳米粒子,以N-异丙基丙烯酰胺(NIPAM)、N,N'-亚甲基双丙烯酰胺(MBA)和偶氮二异丁腈(AIBN)为原料,用种子乳液聚合法制备了具有温敏性的Fe<sub>3</sub>O<sub>4</sub>/PNIPAM纳米复合微球。用红外光谱仪(FTIR)、透射电镜(TEM)、热重分析仪(TGA)及Zeta粒度仪(DTS)等手段对复合微球进行了表征,研究了单体(NIPAM)、交联剂(MBA)、乳化剂(SDBS)用量对复合微球粒径及磁含量的影响。结果表明:Fe<sub>3</sub>O<sub>4</sub>/PNIPAM纳米复合微球呈球形,具有温敏性,反应条件对复合微球的结构和形貌有较为显著的影响,其粒径和磁含量随着单体浓度的减少、交联剂和乳化剂用量的增加而变小。

**关键词:** 复合材料 聚N-异丙基丙烯酰胺 纳米复合微球 粒径 磁含量

### Preparation of Fe<sub>3</sub>O<sub>4</sub>/PNIPAM Nano-scale Composite-microspheres

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**Abstract:** Magnetic Fe<sub>3</sub>O<sub>4</sub> nanoparticles were prepared by co-precipitation, and further encapsulated with poly(N-isopropylacrylamide) via seeded emulsion polymerization to form Fe<sub>3</sub>O<sub>4</sub>/PNIPAM nano-scale composite-microspheres. The microspheres were characterized by FTIR, TEM, TGA and DTS. Herewith the effects of the concentration of monomer (NIPAM), cross-linker (MBA) and emulsifier (SDBS) on the diameter, magnetic Fe<sub>3</sub>O<sub>4</sub> content of the microspheres were investigated. The reaction parameters show notable influence on the structure and morphology of the microspheres, and as a result, the diameter and magnetite content of the microspheres decreased with the decrease of monomer concentration and the increase of cross-linker concentration and emulsifier concentration.

**Keywords:** composites poly (N-isopropylacrylamide) nano-scale composite-microspheres diameter magnetite content

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