

材料化学工程与纳米技术

## 聚(丙烯酸-丙烯酰胺)/水滑石纳米复合高吸水性树脂的制备及表征

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摘要

首先用尿素法合成了水滑石(HT), 然后用甲基丙烯磺酸钠(SMAS)对水滑石进行插层, 得到了插层的水滑石(SMAS-HT), 最后通过反相悬浮聚合制备了一种新型的聚(丙烯酸-丙烯酰胺)/水滑石纳米复合高吸水性树脂, 其中 $N,N'$ -亚甲基双丙烯酰胺(NMBA)为交联剂, 过硫酸钾(KPS)为引发剂。通过傅里叶变换红外光谱(FTIR)、X-射线衍射(XRD)及扫描电镜(SEM)等手段表征其结构和形貌。考察了SMAS-HT的含量对其吸水(盐)性能的影响。结果表明, 插入SMAS的水滑石片层在聚合后发生了剥离, 添加少量的SMAS-HT可以明显提高树脂的吸水(盐)性能, 当SMAS-HT含量为3.0%(质量)时, 树脂的吸(盐)水性能达到最大。

关键词

[水滑石](#) [纳米复合材料](#) [高吸水性树脂](#)

分类号

## Preparation and characterization of poly(acrylic acid-co-acrylamide)/hydrotalcite nanocomposite superabsorbent

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### Abstract

The hydrotalcite (HT) synthesized with urea method was used to prepare intercalated HT (SMAS-HT) by using methyl allyl sulfonate (SMAS) as an intercalation agent. A novel poly (acrylic acid-co-acrylamide)/HT nanocomposite superabsorbent was prepared by inverse polymerization, using  $N,N'$ -methylenebisacrylamide (NMBA) as a crosslinking agent and potassium persulfate (KPS) as an initiator. The structure and morphology were characterized by FTIR, XRD and SEM. The influences of the amount of SMAS-HT on the water (salt) absorbency were studied. The results showed that the intercalation was successful and SMAS-HT was completely exfoliated after polymerization. Adding a small amount of SMAS-HT could effectively improve the water (salt) absorbency of nanocomposite superabsorbents. The nanocomposite superabsorbents had their highest water (salt) absorbency when the content of SMAS-HT was 3.0%(mass).

### Key words

[hydrotalcite](#) [nanocomposite](#) [superabsorbent](#)

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