

用荧光方法研究端基为芘的聚苯乙烯在溶液中的聚集行为

唐廷基,叶宇,李子臣,杜福胜,张昕,李福绵

北京大学化学学院高分子科学与工程系,北京(100871)

收稿日期 修回日期 网络版发布日期 接受日期

摘要 利用原子转移自由基聚合(ATRP)方法合成了窄分布的端基含有芘或萘的聚苯乙烯(Py-PS和Na-PS)。研究了Py-PS在四氢呋喃(THF)溶液中的荧光发射光谱随加水量的变化。结果表明,加水初期随着加水量的增加,对应于芘的单体荧光发射峰强度(I_M)增加,当水加到一定量时,观察到由芘形成的激基缔合物(excimer)的荧光光谱峰,其强度(I_E)随加水量的增加而进一步增强,而I_M下降,直至体系产生宏观的相分离,此时I_M和I_E均不变。对这一结果从分子水平上进行了讨论,并通过I_E/I_M与I₁/I₃随加水量的变化得到了不同浓度下Py-PS在THF中聚集的临界加水量。另外,我们也用非辐射能量转移(NRET)的方法研究了Py-PS混合溶液的聚集。这些结果对于进一步研究含聚苯乙烯链段的嵌段共聚物在溶液中的聚集有重要意义。

关键词 [聚苯乙烯](#) [聚集体](#) [芘](#) [萘](#) [荧光](#)

分类号 [0631.3](#)

Fluorescence Study on the Aggregation Behavior of Pyrene-end-capped Polystyrene in Solution

Tang Tingji, Ye Yu, Li Zichen, Du Fusheng, Zhang Xin, Li Fumian

Department of Polymer Science & Engineering, College of Chemistry, Peking University, Beijing(100871)

Abstract Low polydispersive polystyrenes, tethered with pyrene (Py-PS) or naphthalene (Na-PS) at one end of the chain, were synthesized by atom transfer radical polymerization (ATRP). The fluorescence emission spectra of Py-PS in THF were measured with different amount of water added. The results indicate that the "monomer" fluorescence intensity (I_M) of pyrene increased progressively with the increase of water content; and as the water content reached a certain amount, the emission of pyrene excimer was observed, whose intensity (I_E) increased when water was further added, until a macroscopical phase separation appeared. The critical added water contents for Py-PS at three concentrations were obtained from the changes of I_E/I_M and I₁/I₃ with the addition of water. Nonradiative energy transfer (NRET) was also exploited for a mixture of Py-PS and Na-PS in THF. The results may help to understand the aggregation of PS, as well as copolymers containing polystyrene block in solution containing different amount of water.

Key words [POLYSTYRENE](#) [AGGREGATES](#) [PYRENE](#) [NAPHTHALENE](#) [FLUORESCENCE](#)

DOI:

通讯作者

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(0KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中包含“聚苯乙烯”的相关文章](#)

▶ [本文作者相关文章](#)

- [唐廷基](#)
- [叶宇](#)
- [李子臣](#)
- [杜福胜](#)
- [张昕](#)
- [李福绵](#)