

## 论文

### 固体核磁法研究苯酚与聚4-乙烯基吡啶的相互作用

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#### 摘要:

采用高速魔角旋转(MAS)偶极滤波结合氘代稀释固体核磁技术, 研究了极性吸附分离材料聚乙烯吡啶与氘代苯酚之间的相互作用. 固体核磁结果表明, 聚乙烯吡啶与苯酚之间存在强的氢键作用, 与液体氢谱结果一致. 由MAS中水峰强度在吸附前后的变化揭示了苯酚部分置换了聚乙烯吡啶中的水, 且苯酚和聚乙烯吡啶氢键作用位点在靠近N的一端. 此种方法对于原位研究吸附剂的吸附机理以及新型吸附分离材料的设计具有重要的指导意义.

关键词: 氢键; 偶极滤波魔角旋转NMR; 氘稀释; 小分子探针

### Interaction Between Phenol and Poly(4-vinylpyridine) Using Solid State NMR Method

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#### Abstract:

The interaction between phenol and poly(4-vinylpyridine) was investigated by means of the technique of dipolar filtered fast magic angle spinning(DF-MAS) combined with deuterium dilution <sup>1</sup>H NMR. Experiment results reveal that strong hydrogen bond exist between phenol and poly(4-vinylpyridine), which is in good agreement with the data obtained from liquid state <sup>1</sup>H NMR. Moreover, the difference in signals of water in MAS NMR disclosed that water was replaced by phenol in the binding with P4VP, and the interaction site between P4VP and phenol was on the H atoms which were near the N atom. Thus, this protocol was proved to be a powerful method for studying adsorption mechanism between insoluble adsorbents and target molecule *in situ*, which may facilitate the designing for new materials for adsorption and separation.

Keywords: Hydrogen bond; DF-MAS NMR; Deuterium dilution; Small molecule probe

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#### 参考文献:

1. Egger N., Schmidtrohr K., Blumich B., *et al.*. Appl. Polym. Sci. [J], 1992, 44: 289—295
2. Sun P. C., Dang Q. Q., Li B. H., *et al.*. Macromolecules [J], 2005, 389(13): 5654—5667
3. Li B. H., Xu L., Wu Q., *et al.*. Macromolecules

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- [J], 2007, 40(16): 5776—5786
4. Schmidt-Rohr K., Spies H.W. Multidimensional Solid-state NMR and Polymers [M], San Diego: Academic Press, 1994
  5. Wang X. L., Gu Q., Sun Q., *et al.* Macromolecules [J], 2007, 40(25): 9018—9025
  6. XU Wen(徐旻), ZHANG Hui-Ping(张惠平), CHEN Qun(陈群), *et al.* Chem. J. Chinese Universities (高等学校化学学报) [J], 2004, 25(10): 1901—1904
  7. WEI Zhong(魏忠), HUANG Wei(黄微), LI Ji-Hong(李纪红), *et al.* Chem. J. Chinese Universities(高等学校化学学报) [J], 2007, 28(9): 1735—1738
  8. LI Ji-Hong(李纪红), YU Mei(俞枚), WANG Hui-Yan(王辉彦), *et al.* Chem. J. Chinese Universities(高等学校化学学报) [J], 2006, 27(6): 1066—1069

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