

研究论文

PVP-LiCl-DMF溶液体系的流变学特性及相互作用

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**摘要** 利用流变学方法, 采用核磁共振和红外光谱技术开展了聚乙烯吡咯烷酮(PVP)和LiCl相互作用研究, PVP/LiCl/DMF浓溶液的表观粘度随着LiCl含量的增加而提高, 溶液的粘流活化能也相应增加。<sup>13</sup>C NMR结果表明, 溶液中Li<sup>+</sup>与PVP的羰基之间存在相互作用, 这种相互作用改变了PVP分子的聚集状态. 红外光谱结果证实了PVP/LiCl复合物中Li<sup>+</sup>与PVP的羰基存在相互作用.

**关键词** [聚乙烯吡咯烷酮](#) [流变学](#) [红外光谱](#) [核磁共振](#)

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Investigation on the Rheological Characteristics and Interactions of PVP-LiCl-DMF Solution System

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**Abstract** The interaction between poly(vinyl pyrrolidone)(PVP) and lithium chloride was studied by rheological method, <sup>13</sup>C NMR and FTIR spectroscopy. The results showed that the apparent viscosity, the activation energy and the critical shear thinning rate of the concentrated PVP-LiCl-DMF solution are obviously influenced by lithium chloride. The apparent viscosity increases with the increasing of the content of the lithium chloride, and the activation energy of the solution increases as well, while the critical shear thinning rate decreases with increasing the content of lithium chloride. <sup>13</sup>C NMR spectra proved the interaction between Li<sup>+</sup> ion and the carbonyl group from PVP and DMF molecules in PVP/LiCl/DMF solution. These results indicate that the obvious interactions between Li<sup>+</sup> ion and PVP in the solution result in the variation of the aggregation state of PVP molecules. The IR spectra of the PVP/LiCl composites showed that there are interactions between Li<sup>+</sup> ion and carbonyl group in the lactam of PVP unit, and the curve fitting results also indicated the existence of several coordination structure between Li<sup>+</sup> ion and carbonyl groups.

**Key words** [Poly\(vinyl pyrrolidone\)](#); [Rheology](#); [FTIR spectroscopy](#); [NMR spectroscopy](#)

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