

Effect of Phosphatidylcholine on the Rheological Properties of HTPB-Styrene Solution

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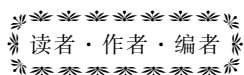
Abstract: For further understanding of interaction between phosphatidylcholine and hydroxyl-terminated polybutadiene (HTPB) in styrene solution, the effect of phosphatidylcholine on the rheological properties of HTPB-styrene solution was studied by viscometric method. The viscosity changing factor ($|C|$) was used to characterize the degree of molecular interaction between phosphatidylcholine and HTPB. In this approach, the blending behavior of phosphatidylcholine and HTPB in mixed solution system was further discussed. Meanwhile, the effect of the relative contents of phosphatidylcholine and HTPB on the interaction degree was researched. Results show that the solution viscosity increases with the increasing of phosphatidylcholine. And the solution exhibits a more remarkable non-Newtonian behavior. The flow activation energy (E) first increases and then decreases, while the interaction degree between phosphatidylcholine and HTPB first decreases and then increases. $|C|$ increases to the maximum value of 0.165 and E/R decreases to the minimum value of 1004.9 as phosphatidylcholine content reaches to 0.053.

Keywords: hydroxyl-terminated polybutadiene (HTPB), phosphatidylcholine, polymer solution, rheological properties

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《含能材料》高效毁伤弹药专栏征稿

高效毁伤弹药以“利用最小化成本获得最大化效果”为目标,对含能材料的性能和能量提出了更高的要求。为进一步促进高效毁伤弹药及其技术的研究,本刊将于2015年增设高效毁伤弹药专栏,内容涉及(1)传统含能材料的优化和改进以及先进含能材料的开发和应用,包括:传统含能材料合成、制造、处理和应用的新技术,新的CHON含能材料的开发和应用,金属化炸药,非传统概念炸药(如燃料空气炸药、温压炸药),高能量密度材料;(2)含能材料能量的控制输出研究,包括:能量输出增强(如组合装药),能量输出聚焦/定向,能量输出模式可控(如多模装药),能量输出范围可控(如低附带毁伤炸药)。欢迎广大学者投稿,来稿时请选择对应的专栏。

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