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Synthesis and Curing of Poly(glycidyl nitrate)(PGN)

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Abstract: Two kinds of poly(glycidyl nitrate)(PGN) binders with molecular weight of about 3000 were synthesized via cationic polymerization using glycidyl nitrate(GN) with purity of more than 99.5% as raw material. Their structures were characterized by infrared spectroscopy(IR), nuclear magnetic resonance(NMR) and gel permeation chromatograph(GPC). The main properties of PGN were tested. The curing reaction of PGN with common isocyanates, polyaryl polymethylene isocyanate(PAPI), modified hexamethylene polyisocyanate(N-100), toluene diisocyanate(TDI), dicyclohexyl methane diisocyanate(HMDI) was studied. Results show that the curing reaction of PGN can performed rapidly with PAPI, N-100, TDI and HMDI etc. under the action of catalysts dibutyltin dilaurate(DBTDL) or triphenyl bismuth(TPB), and the cured samples have no obvious decrease in Shore A hardness after storeing at 60 ℃ for 60 days.

Key words: polymer; energetic binder; cationic polymerization; poly(glycidyl nitrate)(PGN); isocyanate; Shore A hardness
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更正

1.《含能材料》2016 年第 8 期《含能材料中间体 3,7,10-三氧代-2,4,6,8,9,11-六苄基-2,4,6,8,9,11-六氮杂[3,3,3]螺浆烷(HBPTO)的合成、表征及工艺改进》一文中的 $K_3Fe(CN)_3$ 应为 $K_3Fe(CN)_6$。

2.《含能材料》2016 年第 8 期《联氮杂芳环含能化合物研究进展》一文表 2 中 PbN_3 应为 $Pb(N_3)_2$。

特此更正。

《含能材料》编辑部