

Preparation of WPU-g-SAN and Its Coating on HNIW

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Abstract: In order to reduce the sensitivity of hexanitrohexaazaisowurtzitane (HNIW), the waterborne polyurethane grafted styrene and acrylonitrile copolymer (WPU-g-SAN) were synthesized from isophorone diisocyanate (IPDI), 2-hydroxyethyl methacrylate (HEMA), styrene (S) and acrylonitrile (AN) as raw materials by seeded emulsion polymerization in situ. The cast films obtained from WPU-g-SAN were characterized by Fourier transform infrared (FTIR), wide-angle X-ray diffraction (WAXD), nuclear magnetic resonance (¹H NMR) and dynamic mechanical analysis (DMA). The results showed that the title copolymer was amorphous and exhibited a certain degree of phase separation. HNIW and HNIW coated with the WPU-g-SAN were examined by X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM). The impact sensitivity was tested by method of GJB772A-1997. The experimental results indicated that the characteristic height H_{50} of HNIW coated with WPU-g-SAN increases from 13.6 cm to 28.5 cm.

Key words: polymer chemistry; waterborne polyurethane-grafted-styrene and acrylonitrile composite (WPU-g-SAN); seeded emulsion polymerization in situ; hexanitrohexaazaisowurtzitane (HNIW); impact sensitivity

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研究快报应简要报道含能材料领域的前沿性、创新性研究成果。编辑部鼓励研究者发表新思想、新观点、新原理和新发现,支持报道阶段性的重要研究成果的简要情况。凡被本刊以快报形式刊登的研究成果,编辑部按照国际学术惯例,允许作者以完整的研究论文的形式发表在其他国内外刊物上。

研究快报的来稿要求与投本刊的研究论文基本一致。作者投稿时需要对文章的学术价值和创新性进行简要说明。来稿要求关键数据齐备,结论明确,背景、方法和过程的介绍从简。来稿需有中英文摘要、关键词、作者简介、基金项目等信息。全文篇幅在2页(约4000字)以内。

本刊对研究快报将即审即发,以提高时效性。对有基金支持的英文稿件择优录用。

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