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α-AlH_3 Coated with Stearic Acid: Preparation and its Electrostatic Sensitivity

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Abstract: To reduce the electrostatic sensitivity of α-AlH_3, α-AlH_3 was coated by the solvent-nonsolvent method using stearic acid (SA) as coating material. The crystal structure and morphology of samples before and after coating were characterized by Fourier transform infrared spectroscopy (FT-IR), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), elemental analysis and scanning electron microscopy (SEM). The electrostatic sensitivity of α-AlH_3 samples before and after coating was measured by JGY-50Ⅲ type static spark sensitivity tester according to GJB5891.27-2006 method. Results show that a complete, uniform coating layer of SA is formed on the surface of α-AlH_3. The crystal structure and morphology of the sample after coating are not changed. When the spark energy required for 50% initiation probability (E_{50}) decreases from 367 mJ before coating to test limit 5390 mJ, the fire does not occur. The coating makes the electrostatic sensitivity reduce.

Key words: α-AlH_3; electrostatic sensitivity; stearic acid (SA); solvent-nonsolvent
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《含能材料》"含能共晶"征稿

含能共晶是不同含能分子通过氢键等相互作用力形成的具有稳定结构和性能的分子晶体。含能共晶充分组合了单质含能分子的优点,呈现出感度低,综合性能优良的特点,具有潜在的应用前景,共晶研究已经引起国内外含能材料学界的高度关注。为推动含能共晶的研究和交流,本刊特主办"含能共晶"专栏,主要征稿范围包括含能共晶晶体设计与性能预测、含能共晶的制备、结构解析、性能等。来稿请注明"含能共晶"专栏。

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