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Determination of PETN Content in PBX by High Performance Liquid Chromatography

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Abstract: A selective and sensitive high performance liquid chromatography (HPLC) was optimized for quantitative analysis of pentaerythritol tetranitrate (PETN) based polymer bonder explosive (PBX) with conditions of SB-C18 column (4.5 mm×250 mm, 5 μ m), UV detector, mobile phase V(acetonitrile): V(water)=70:30, flow rate of 1.0 mL·min⁻¹ and detection wavelength 225 nm. The influences of sample treat method, sample mass and solvent were studied. Results show that the relative standard deviation of reproducibility is 0.13% when PBX sample is cutted to granule (volume 1.0 mm³, mass 200 mg) in 100 mL flask and ultrasonic dissolved 30 min by acetonitrile and then stands for 16 h. The detection limit for PETN is 0.054 μ g·mL⁻¹ and there is a good linear between the peak areas and the mass concentration of 0.8–2.0 mg·mL⁻¹ with linear correlation coefficients of 0.9994.

Key words: polymer bonder explosive (PBX); pentaerythritol tetranitrate (PETN); high performance liquid chromatography (HPLC)

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