Swelling Behaviors of NC/NG Absorbent Tablets

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Abstract: To explore the best solvent of swelling the nitrocellulose(NC)/nitroglycerin(NG) absorbent tablets and the influence of predrying treatment on the swelling behaviors of absorbent tablet, the free swelling process of absorbent tablet with or without predrying treatment in single solvent such as acetone and ethyl acetate and mixed solvents such as ether/ethanol, ethanol/acetone and ethanol/ethyl acetate et aletc., was studied using the weighting method. One dimension diffusion behaviors of solvents, acetone, ethyl acetate and ethanol/ether ($V_{ethanol}$: V_{ether} = 1 : 2) in absorbent bar were studied by "line tracing method". The free swelling kinetic equations of the absorbent tablets in various solvents and one dimension diffusion equations of three solvents, acetone, ethyl acetate and ethanol/ether ($V_{ethanol}$: V_{ether} = 1 : 2) in absorbent bar were obtained. Results show that from the comprehensive consideration of swelling rate and equilibrium swelling degree, the comprehensive swelling effect of ethyl acetate and ethanol/ethyl acetate are the best for absorbent tablets. The predrying treatment can improve the equilibrium swelling degree and initial swelling rate of absorbent tablets in the solvents. There is no direct correlation between the swelling rate of absorbent tablet in the solvents and "one dimension diffusion" rate of solvents in absorbent tablets.

Key words: absorbent tablet; swelling behavior; propellant; extrusion molding; saturated swelling degree

CLC number: TJ55 **Document code**: A **DOI**: 10.11943/j.issn.1006-9941.2017.07.010

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更 正

本刊 2017 年第 3 期 184 页《温度对 HTPB 推进剂疲劳特性的影响》一文的第 2 作者单位应为：中国兵器工业导航与控制技术研究所。对应的英文为 Navigation and Control Technology Research Institute, China North Industries Group Corporation。

特此更正。

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