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## Investigation on HZSM-5 Assisted Selective Nitration of Chlorobenzene with $N_2O_5$

QIAN Hua, YE Zhi-wen, LÜ Chun-xu

(School of Chemical and Engineering, Nanjing University of Science and Technology, Nanjing 210094, China)

**Abstract:** *p*-Mononitrochlorobenzene is an important raw materials for synthesizing high energy materials. Its industrial production involving the concentrated mineral acids as the catalysts is one of the most environmentally harmful processes. Huge amounts of wastes along with a large amount of undesired *o*-mononitrochlorobenzene due to the nonselective nitration of chlorobenzene. Nitration of chlorobenzene by  $N_2O_5$  was investigated with solid acid catalyst HZSM-5. For the excellent selectivity of HZSM-5, the ratio of *p*-mononitrochlorobenzene increased from 42% to 81%. Effects of reaction temperature, reaction time, amount of catalyst and the ratio of Si/Al on the nitration were investigated. When  $T = 50\text{ }^\circ\text{C}$ ,  $t = 1\text{ h}$  and 5 g catalyst (Si/Al = 260), the reaction condition is optimum, the yield of nitration of chlorobenzene was 50% and para-selectivity was 85.5%.

**Key words:** applied chemistry; dinitrogen pentoxide; chlorobenzene; nitration; clean

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## Characteristic of Prilled Ammonium Dinitramide Photolyzed with Sunlight

XU Hui-xiang<sup>1</sup>, CHEN Zhi-qun<sup>1</sup>, ZHAO Feng-qi<sup>1</sup>, KANG Jian-cheng<sup>2</sup>

(1. Xi'an Modern Chemistry Research Institute, Xi'an 710065, China;

2. Military Office of PLA Stationed at Shaanxi Region, Taiyuan 030008, China)

**Abstract:** The experiment of photolyzing prilled ADN with sunlight on solid phase were carried out to investigate the effect of photolysis on the purity, sensitivity and the apparent storage life of ammonium dinitramide. The process of photolyzing ADN was measured by IR analysis, the purity and apparent storage life of photolyzed ADN were tested by the liquid chromatogram. The result indicates that the product of photolysis is ammonium nitrate, and the apparent storage life of ADN photolyzed with sunlight are 756.2 days. The appearance of photolyzed ADN is analyzed by SEM. The friction and impact sensitivities of ADN all reduce, which were tested according to military standard of China. So the purity of ADN reduces after photolyzing, but the decomposition of ADN is restrained because ADN grain is coated by the crystal of sphericized AN formed from the photolyzing.

**Key words:** applied chemistry; prilled ammonium dinitramide; photolyzing; the apparent deposited life

※ 读者·作者·编者 ※

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