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## Synthesis and Characterization of 1-Amino-3-methyl-1,2,3-triazolium Nitrate

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**Abstract**: 1-Amino-3-methyl-1,2,3-triazolium nitrate (1-AMTN) was synthesized using glyoxal and hydrazine hydrate as starting materials in three steps, i. e. addition-elimination, cyclization, methylation and replacement reaction. The overall yield is 71.8% (based on glyoxal). The structure of products was confirmed by IR, MS, NMR and elemental analysis. The properties of 1-AMTN were estimated: density 1.63 $g \cdot cm^{-3}$, enthalpy of formation 84 $kJ \cdot mol^{-1}$ and detonation velocity 8115 $m \cdot s^{-1}$. The key factors of cyclization and methylation were studied and the optimal reaction conditions were confirmed: medium acetonitrile, 20 ℃, and the ratio of glyoxal bishydrazone and methyl Iodide 1 : 5. The overall yield of cyclization and methylation is 86.7%. In addition, actived manganese oxide was recycled and its mechanism was also discussed.

**Key words**: organic chemistry; 1-amino-3-methyl-1,2,3-triazolium nitrate (1-AMTN); synthesis; characterization

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