



**CHM-7**

## Preparation and Characterization of 3-nitro-1,2,4-triazole-5-one (NTO) Explosive

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3-Nitro-1,2,4-triazol-5-one (NTO) is an explosive ingredient under investigation as a potential insensitive replacement for RDX in explosive formulations. Although its performance is slightly less than that of RDX, NTO is thermally more stable and less sensitive to hazard stimuli. Explosive compositions based on NTO are therefore more likely to be extremely insensitive detonating substances, and munitions filled with them may meet the criteria of Insensitive Munitions (IM). In this paper, different methods have been studied in order to obtain NTO by a safe method and high yield. The obtained NTO has been characterized; spectral properties by FTIR, thermal analysis by DSC, crystal morphology study by SEM and sensitivity to different stimuli. It was concluded that the characteristics of the obtained NTO are greatly affected by the purity of the obtained product.