

Energetic polynitrogen heterocycles: synthesis and performance

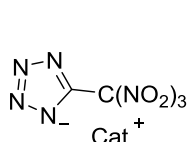
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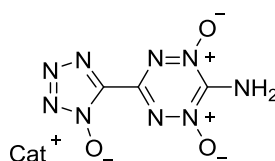
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Polynitrogen heterocycles are of paramount importance in the design and preparation of novel organic materials. As a rule, polynitrogen heterocycles exhibit an optimal set of functional properties enabling their application potential in energetic materials science [1]. Herein, we present recent achievements of our research group in the synthesis of structurally diverse polynitrogen heterocyclic compounds incorporating tetrazole [2] and tetrazine rings. An estimation of crucial physicochemical parameters along with an application potential of the synthesized compounds as energetic materials will also be discussed.



T_d : 112-136 °C
 ρ : 1.70-1.85 g cm⁻³
[N + O]: 82-88%
 ΔH_f° : 140-726 kJ mol⁻¹
D: 8.2-9.2 km s⁻¹
P: 29-38 GPa



T_d : 160-212 °C
 ρ : 1.75-1.78 g cm⁻³
[N + O]: 77-83%
 ΔH_f° : 413-779 kJ mol⁻¹
D: 8.5-8.8 km s⁻¹
P: 31-33 GPa

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[1] S.G. Zlotin, A.M. Churakov, M.P. Egorov, L.L. Fershtat, M.S. Klenov, I.V. Kuchurov, N.N. Makhova, G.A. Smirnov, Yu.V. Tomilov, V.A. Tartakovskiy, *Mendeleev Commun.* **2021**, *31*, pp. 731-749.

[2] D.A. Chaplygin, A.A. Larin, N.V. Muravyev, D.B. Meerov, E.K. Kosareva, V.G. Kiselev, A.N. Pivkina, I.V. Ananyev, L.L. Fershtat, *Dalton Trans.* **2021**, *50*, pp. 13778-13785.