D-12

Synthesis and physical properties of 2,6,8-triazidopurine and 2,4,6,8-tetraazidopyrimido[5,4-*d*]pyrimidine

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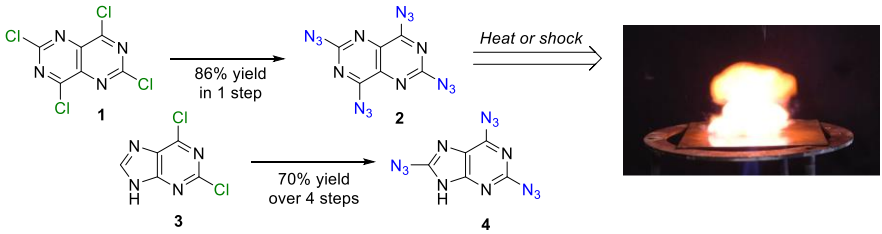
Binary C_xN_y organic compounds are impact-sensitive and possess explosive properties due to the high nitrogen content. The performance of nitrogen-rich compounds is attributed to the high heat of formation. Moreover, the main combustion product of such nitrogen-rich compounds is non-toxic nitrogen gas rather than the CO_2 from oxidation of a carbon backbone as in traditionally used explosives (TNT, RDX). Hence, nitrogen-rich compounds are currently the most promising candidates for the next-generation "green" explosives.[1]

To the best of our knowledge, purine and its homologue - pyrimido[5,4-*d*]pyrimidine have not been used in the synthesis of energetic materials before. However, the nitrogen-rich backbone presents excellent features for application as high energy density materials. Recently, we have designed an approach towards binary C_6N_{16} compound **2** and triazidopurine (**4**) and tested their energetic properties (Scheme 1).[2]



Scheme 1. Synthesis of polyazides **2** and **4**.

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