# 5-AMINO-3,4-DINITROPYRAZOLE: THERMAL STABILITY AND COMBUSTION

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**Abstract:** Novel energetic compound 5-amino-3,4-dinitropyrazole (5-ADP) has been extensively studied. Calculated detonation parameters prove the high energy content in this molecule. Thermal stability has been assessed using various techniques. The onset decomposition temperature of 5-ADP, as has been defined by accelerating rate calorimeter, was found to be lower than that one for CL-20. Compound 5-ADP is insensitive to friction and possesses low impact sensitivity. Chemical compatibility has been evaluated for binary mixtures of 5-ADP with some common energetic materials using standard techniques. Small-scale DSC (differential scanning calorimetry) tests signified some problems with the active binder, whereas the more sensitive ARC (accelerating rate calorimeter) technique revealed the reasonable compatibility. Burning rate pressure exponent for 5-amino-3,4-dinitropyrazole monopropellant was found to be 0.5, which is lower than the typical values for explosives (RDX, HMX, etc.). The addition of ammonium perchlorate resulted in the burning rate increases without change of the pressure exponent. The whole set of experimental results reveals 5-amino-3,4-dinitropyrazole to have positive perspectives as an energetic material.

**Keywords:** 5-amino-3,4-dinitropyrazole; thermal stability; chemical compatibility; burning rate parameters

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