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## Preparation and properties of submicrometer-sized ADNI: A novel promising initiating explosive

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In this work, the synthesis process of N-animo dinitroimidazole (ADNI) were firstly optimized by using different reaction conditions such as solvent, amination agents with on line infrared analysis. ADNI and its reaction precasor were fully characterized by single crystal X-ray diffraction. The properties of ADNI is first reported and which shows very good sensivity (impact sensitivity: >40 J, friction sensitivity: >360 N,  $H_{50}$ =104.2cm) and thermally stability ( $T_d$ =270°, 5S shotpoint 312°). Their explosive performances were computed by using the EXPLO5 v6.02 program. Which shows favorable densities (1.774 g.cm<sup>-3</sup>), good detonation properties (P=31.9 GPa; vD=8500 m.s<sup>-1</sup>). These properties are better than some known energetic compounds, such as TNT (P=19.5 GPa; vD=6881 m. s<sup>-1</sup>) and TATB (P= 31.2 GPa; vD=8114 m.s<sup>-1</sup>), and are comparable to RDX (P=35.0 GPa; vD=8762 m s<sup>-1</sup>). The synthesis of N-animo dinitroimidazole (ADNI) was optimized at hectogram level with total yield increase from 40% to 68%.

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