

Matter: **Assessment of the thesis supervisor**

Thesis: Low Melting Explosives

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The aim of the submitted diploma thesis of Bc. Preslav Krasimirova Zheleva is to present literature research for suitable low-melting explosive materials for additive manufacturing with specific requirements of good thermal stability in the liquid phase and their reasonable synthesis.

In the theoretical part, a large number of suitable compounds were searched and sorted out as castable explosives, explosives for additive manufacturing. The main search tools were the ICT database of thermochemical quantities and the secondary literature Reaxys. From the several thousands of compounds found, suitable groups of compounds and suitable substances were selected, of which about a hundred were treated in the theoretical work. Both suitable compounds and a possibly interesting group of compounds, such as azido, fluoro, and perchlorate compounds, were selected. Also, aromatic compounds were not omitted. The work was targeted as an initial study, with the aim of including diverse groups for later shortlisting, which is where the thesis has its scope. This section is comprehensive and includes 151 references. A debt to the processing of an unusual amount of data for a thesis is some inconsistency in the completeness of the literature references.

The practical part is devoted to the twenty compounds that have been prepared and analyzed. Most of the procedures are from the published literature, however, a significant number of procedures had to be modified to achieve the desired product. This required laboratory skill, resistance to partial failures and patience, which the graduate student successfully managed. The experimental section then presents only the currently best practices, making the thesis clear. Melting points, thermal analyses by DTA, densities and basic data on impact and friction sensitivity were also measured for the substances.

In the discussion section, suitable compounds were selected, primarily on the basis of liquid-phase stability by DTA, from a relatively certain liquid-phase thermal stability interval of 100°C. Densities and basic values of sensitivities to friction and impact were measured.

The graduate student consulted appropriately during the course of her thesis, while maintaining a high degree of independence.

The results are briefly and clearly summarized in the discussion section. I state that the thesis assignment has been fulfilled.

I recommend accepting the thesis for defence and marking it with the **A grade**

Pardubice 16 May 2025

doc. Ing. Zdeněk Jalový, Ph.D.