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Thermal safety characterization and explosion violence of energetic materials PETER HSU, GARY HUST, PHILIP PAGORIA, LARRY FRIED, Lawrence Livermore National Laboratory — Some energetic materials could thermally explode at fairly low temperatures (<100 C) and the violence from thermal explosion may cause a significant damage. Thus understanding the response of energetic material to thermal events is very important for the storage and handling of energetic materials. Over the last few decades, there has been considerable research effort on the thermal decomposition and thermal explosion violence of energetic materials at elevated temperatures in different sample geometries and confinements. Among them, the ODTX system is an interesting option due to its sample requirement and easiness for data modeling. It has been used since 1970s for cook-off study at LLNL. It generates 3 technical data: (1) lowest temperature at which thermal explosion would occur (threshold temperature, T_{il}), (2) times to thermal explosion at temperature above T_{il}, for the calculation of activation energy and frequency factor; and (3) thermal explosion violence. In this paper, we will present some recent ODTX experimental data of several new energetic materials as well as gas pressure data at elevated temperature.

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