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Shear induced controlled energy release in energetic materials TIMOTHY JENKINS, JENNIFER CIEZAK-JENKINS, US Army Rsch Lab - Aberdeen — Shearing of compressed molecular crystals has been shown to introduce both chemical reaction and phase transitions through the modifications of both the inter- and intra-molecular interactions. While most research has involved lower energy mechanochemical techniques, such as ball milling, there is the potential for significant chemistry at higher pressures and shears. Plastic and elastic deformations of crystals can potentially lead to energy release, as has been shown in previous work; however these results are not well understood. Molecular crystals have been investigated in a controlled fashion using a rotational diamond anvil cell (RDAC) with both traditional energetics and non-traditional energetics such as sucrose. The experiments provide results for validation of theory and modeling.

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