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Investigation of Explosive Spin Crossover Complexes for On-Demand Initiation Sensitivity and Energetic Polymers for Additive Manufacturing THUY-AI NGUYEN, DAVID CHAVEZ, ALEXANDER MUELLER, BRYCE TAPPAN, JACQUELINE VEAUTHIER, Los Alamos National Laboratory — Enhanced safety, with the ability to control detonation behavior, while maintaining energy output are highly desirable characteristics for new high explosive (HE) materials. The use of switchable explosive spin crossover (ExSCO) compounds is a potentially powerful strategy to access on-demand mechanical sensitivity. Spin crossover is a transition between the low spin (LS) and high spin (HS) state electron configurations in a metal complex. We present our variable temperature impact sensitivity results on high nitrogen Fe(II) ExSCO compounds and compare their mechanical sensitivity in the LS vs HS states. In addition, we describe the synthesis and properties of energetic polymers that will be used to develop tunable custom materials for use in the additive manufacturing of explosive parts.

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