

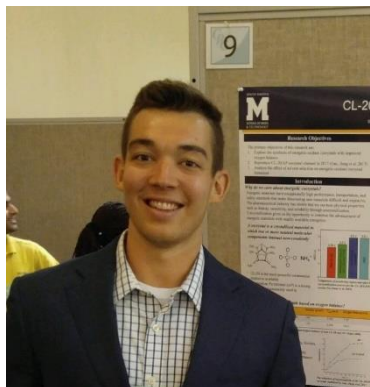
# The Synthesis and Characterization of Novel Energetic Cocrystals

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**Abstract:** Energetic materials, such as propellants, pyrotechnics, and explosives, are utilized in a variety of industry and military applications. While the discovery of novel energetic compounds has slowed, the desire for energetic materials with improved detonation, performance and reduced sensitivity has not. CL-20 is currently the highest performing energetic material available, but has yet to see widespread applications due to safety and production concerns. Cocrystallization has emerged as a valid method of achieving tunable energetic properties without significant reduction in energetic performance and has been utilized in a variety of energetic combinations. In this work, several CL-20 based energetic materials are synthesized via cocrystallization. The resulting crystals were characterized via scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy, thermogravimetric analysis (TGA), and differential scanning calorimetry (DSC) to assess their physical and chemical properties. The overall applicability, performance and scalability of these novel energetic materials is discussed.

**Biography:** Clinton J. Chapman is a PhD Candidate in the department of Chemical and Biological Engineering at South Dakota School of Mines and Technology. Clint's graduate research is focused on the advancement of energetic materials. He has presented his research at several conferences across North America including Gordon Research Conferences and the International Pyrotechnics Symposium. He received B.S. degrees in Chemistry and Physics from Baker University while playing collegiate soccer. During his undergraduate studies, Clint performed research at Kansas University's Center for Environmentally Beneficial Catalysis (CEBC) on the design of environmentally benign catalysts for alkylation of aromatics. Clint has been recognized with several awards including 1<sup>st</sup> place in the poster competition at the International Pyrotechnics Symposium and Chemistry Student of the Year (2014 and 2015) at Baker University. He plans on completing his PhD in the spring 2019 and pursuing a career within industry.



**When: Tuesday, August 28th, 2018 at 4:00 pm**  
**Where: EP#252**