Centennial Honors College

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Poster Presentation

Synthesizing Double Perovskites

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Chemistry

Solid state methods are important to chemistry for the synthesis of new solid materials for analysis and potential applications. Some properties of solid materials that are sought after include electronic, magnetic, and optical properties. A good starting point to finding better materials is synthesizing new materials. There are many methods that can be used. A simple and effective testing method that will be used here is the high temperature, or ceramic method. The technique grants some flexibility and access to temperatures, over 500°C. The reactions are often 10-12 days in length. This method will be used to grow single crystals large enough for proper analysis.

Double perovskites are crystalline material with the general structure $A_2NN'O_6$, with A standing for an Alkaline Earth Metal, N standing for a first row transition metal, N' representing a second or third row transition metal including ruthenium and tungsten. The plan is to attempt to synthesize powders or single crystals of Ba_2CrRuO_6. Single crystals will provide the most information since they are the easiest to analyze. A standard microscope will be used to choose crystals of high enough quality. If a quality crystal is synthesized, it will be taken to an electron microscope at the University of Illinois at Urbana-Champaign for Energy-Dispersive X-ray spectroscopy (EDX). EDX can be used to determine the elemental composition of a crystal. The crystal will be further analyzed with X-Ray crystallography.