

**Report for the Joint Use/Research of the Institute for Planetary Materials,  
Okayama University for FY 2024**

Month/Day/Year

**Category:** ☒International Joint Research ☐General Joint Research ☐Joint Use of Facility  
☐Workshop

**Name of the research project:** Mineralogical and Spectral Characteristics of Natural and Synthesized Jarosite-Alunite Samples, and Implications for Mars' Exploration

**Principal applicant:** Fengke Cao

**Affiliated institution and department:** University of Western Ontario/Chengdu University of Technology

**Collaborator**

**Name:** Matthew Izawa

**Affiliated institution and department:** Institute for Planetary Materials

**Research report:**

**Research Purpose:** Quantify the relationships between crystal structure, Raman spectral signatures, and infrared reflectance spectra for natural and synthetic jarosite and alunite minerals

**Research Actually Conducted:** We achieved our objectives and measured the X-ray diffraction patterns, Raman spectra, and IR signatures of over 60 natural and synthetic jarosite samples covering the H<sub>3</sub>O-K-Na systems in jarosite and alunite.

**Outcomes:** These results have been presented at the 2024 LPSC conference (Cao et al., LPSC 2024 abstract 1782). Our paper is at an advanced draft stage and should be submitted to a journal such as JGR or Icarus within the next few months.