

Investigations in the Smithsonian Gem and Mineral Collection: Challenges and Opportunities

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The National Gem and Mineral Collection at the Smithsonian Institution houses over 385,000 mineral specimens and ~10,000 gems. Characterizing such a large and diverse collection presents exciting opportunities and fascinating challenges that require state-of-the-art instrumentation, including: a X-ray microdiffractometer with imaging plate detector that permits rapid data collection for a variety of different types of samples from micro crystals to large gemstones, Raman spectroscopy, cathodoluminescence, analytical scanning electron microscope, and microCT scanner. Day to day curation and loan activities require quick and accurate phase identification, which in many cases turn into in-depth research projects. A given day might require study of an historic artifact, extremely rare mineral, priceless gem, or an unknown sent by a member of the public. This talk will highlight several examples of applications of X-ray diffraction and other analytical methods used in support of research and curation related to Smithsonian collections and research.