Renée Johanna Schmidt

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Research Interests

My research interests involve the interdisciplinary interactions between geology, chemistry, and biology. My primary focus is in flooded mine water with additional projects in waste water remediation and the geobiochemistry of hot springs. My future research goals are to continue characterizing microbial activities, thermodynamics, and metabolisms in mine waste waters as well as develop new techniques for waste water remediation.

Education

M.S. Geosciences: Geochemistry
Montana Tech of the University of Montana, Butte, MT
Expected May 2017

- GPA: 3.86/4.00
- Research conducted in the EDGE lab with Dr. Alysia Cox
- Thesis explores activities and diversity of microbes found in flooded mine water, with relation to surrounding geochemical environments.

B.S. Chemistry and B.A. Art History
Northern Arizona University, Flagstaff, AZ
May 2013

- Cumulative GPA: 3.85/4.00
- Liberal Studies Honors
- Minor: Studio Arts
- Cum Laude in Chemistry
- Distinguished Senior in Art History

Relevant Work Experience

Energy Laboratories, Billings, MT — February 2014-July 2015
Chemist

- Performed semi-volatile organic compound extractions from soil and water via EPA regulatory methods for GC-MS/SIM analysis. Methods primarily followed the EPA 8000 series which include liquid-liquid extraction, sonication of solid material, toxic characteristic leaching procedures, and waste dilutions.
- Troubleshot issues with client samples that required deviations from EPA methods.
- Managed and prioritized a backlog of incoming samples using an online laboratory information system.
- Ensured lab inventory of spikes, standards, and reagents was up to date and fully stocked.
- Reviewed and revised SOPs for semi-volatile methods.
- Trained new employees in extractions.

Department of Chemistry and Biochemistry, Flagstaff, AZ — August 2010-May 2013
General Chemistry I & II Lab Teaching Assistant

- Prepared and delivered weekly 30-minute PowerPoint presentations comprised of methodology, calculations, and procedures; demonstrated both wet techniques and instrumentation.
- Independently supervised two 3-hour lab sections per week, consisting of 24 students each.
- Received a mean score of 4.96 with a response rate of 89% in the TA laboratory evaluation for Fall and Spring 2012 semesters (on a scale of 1.00-5.00, 5.00 being the highest rating).
- Enforced lab safety regulations based on OSHA/RC training.

RESEARCH EXPERIENCE

Geochemical Testing of Geothermals in Yellowstone National Park July 2015
Alysia Cox, PhD, Department of Chemistry and Geochemistry, Montana Tech

- In field data collection of hot pools and springs were taken to further develop a working inventory which assesses microbial activity found in varying hydrothermal ecosystems. Data were collected with spectrophotometry, meter and thermocouple readings, and microbial sampling. Water samples were filtered and tested in lab using various instrumentation for metals and organic/inorganic carbon.

FTIR Imaging of Oil Painting Varnishes January 2013-May 2013
Michael Ketterer, PhD, and Alyce Jordan, PhD, Department of Chemistry & Biochemistry, Northern Arizona University

- Independent study project using an interdisciplinary approach to analyze compositions and characteristics of modern and aged varnishes using FT-IR and principal component analysis.

Inorganic Synthesis: Tri-Platinum/Palladium Complexes June 2012-December 2012
Stephanie Hurst, PhD, Department of Chemistry & Biochemistry, Northern Arizona University

- Worked with a team to synthesize various forms of tri-platinum/palladium tropylium sandwich complexes. Characterization was through NMR, UV-Vis, and mass spectrometry.

Analytical Geochemistry: Hafnium Extraction from Zircon December 2011-May 2012
Michael Ketterer, PhD, Department of Chemistry & Biochemistry, Northern Arizona University

- Worked independently to develop an effective procedure to digest zircon sand and extract hafnium from zirconium silicate without the use of hydrofluoric acid. Data were acquired using ICP-MS.

PRESENTATIONS

Microbial Habitats in Butte, MT Flooded Mine Shafts April 2016
Techxpo Research Symposium, Montana Tech of the University of Montana

The Power of Urushi December 2010
Department of Comparative Cultural Studies Undergraduate Research Symposium

TECHNICAL EXPERTISE

Wet lab:	Titration (various types), serial dilution, soil digestion, solid-phase column extraction, crystallization, organic/inorganic synthesis, liquid-liquid extraction, condensing, sonication, semi-volatile extractions
Instrumentation:	Aurora TOC Analyzer, Flame-AAS, FTIR, UV-Vis, NMR, ICP-MS, GC-MS, fluorescence spectrometry
Field Work:	Water filtration, *in situ* spectrophotometry (dissolved oxygen, total dissolved sulfide, ferrous iron, aqueous silica), microbial sampling, meter measurements (Hydrolab, conductivity, and pH)

AWARDS

Graduate Research Assistantship	May 2016- May 2017	Montana Tech
Graduate Teaching Assistantship	August 2015- May 2016	Montana Tech
Outstanding Service Award	February 2015	Energy Laboratories, Inc.
Senior Scholar Award	Spring 2013	Outstanding achievement in Chemistry, Northern Arizona University
Percibal Lowell Scholarship Award	Spring 2013	Obtained highest GPA in the Natural Sciences, Northern Arizona University
Distinguished Senior for College of Arts and Letters	Spring 2013	Northern Arizona University
Department of Comparative Cultural Studies Outstanding Senior	Spring 2013	Northern Arizona University
Outstanding Senior in Art History	Spring 2013	Northern Arizona University