

BayCEER Kolloquium

Lectures in Ecology and
Environmental Research

WS 2017/18



UNIVERSITÄT
BAYREUTH

Thursday

14.12.2017

12:00 in H6, GEO



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Canadian Light Source, Saskatoon

A Molecular Scale Approach: X-Ray Absorption Spectroscopy in Environmental Study

As one of the most extensively applied synchrotron techniques, X-ray absorption fine structure (XAFS) spectroscopy plays a unique role in many scientific areas. Its element specific local structure probing capabilities make molecular level understanding for both crystalline and amorphous systems possible.

This presentation will first present X-Ray Absorption Spectroscopy (XAS) facilities and capabilities specific to the Hard X-ray MicroAnalysis (HXMA) beamline at the Canadian Light Source. HXMA is a wiggler-sourced hard X-ray beamline with an energy coverage of 5-40 keV, which is currently the only hard X-ray extended X-ray absorption fine structure (EXAFS) beamline available for Canadian Light Source users.

The presentation will further focus on the principles of XAS as well as its applications. Two X-ray absorption near edge structure (XANES) theoretical modeling guided case studies which will be specifically discussed are (1) the speciation of chromite in a biochar system, and the corresponding size estimation for the sub-nano scale chromite particle of the system, and (2) speciation of vanadyl porphyrins in the oil sands fluid petroleum coke from Alberta, Canada, respectively.