Advanced Materials Characterization using Synchrotron Radiation: Potentials in Environmental and Energy Engineering

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Abstract:

Synchrotron radiation is an accelerator-based light source with extreme brightness and unique properties. It enables the researches and applications by providing a set of techniques which are generally not possible using the regular laboratories and instruments. This presentation will briefly overview the synchrotron radiation, and introduce Canadian Light Source - the national synchrotron facility in Canada. The advanced techniques available for materials characterization will be presented to show the capabilities of X-ray fluorescence spectroscopy, X-ray absorption spectroscopy, X-ray diffraction, and their combinations. Some of the applications will be shared to showcase their potentials in environmental and energy engineering.

Dr Renfei Feng is a Senior Scientist and Beamline Responsible, in charge of a hard X-ray microprobe facility at the Canadian Light Source – the national synchrotron research center in Canada. He is a recognized expert in synchrotron X-ray science, and holds Adjunct Professor in University of Saskatchewan and other three universities in Canada and China. His current research interests focus on Synchrotron Instrumentation and Applications, including the techniques of X-Ray spectroscopies, imaging, diffraction, and their applications in environmental, energy, materials, and life sciences.

Dr Feng obtained his PhD degree in 1993 in Atomic and Molecular Physics. He has been awarded a number of awards including China National and CAS Advancement of Science and Technology Awards, and Royal Society of Chemistry award.

Dr Feng has a wide collaborations with the scientists and engineers from environmental sciences, materials sciences, and life sciences; and authored 200+ peer-refereed publications including 150+ on high-impact international journals.