



## **Applications of Synchrotron-based X-ray Absorption Spectroscopy and Infrared Microscopy to Investigate on Advanced Functional Materials**

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### **ABSTRACT**

The investigation of the local geometric and electronic structure of probing element in bulk samples is the most extensive field of application in X-ray Absorption Spectroscopy (XAS). XAS consists of two main regions which are X-ray Absorption Near Edge Structure (XANES) and Extended X-ray Absorption Fine Structure (EXAFS). The former region is used to explain the local geometry and oxidation states of selected element in a sample whilst the latter one is used to address the local structure around probing element in samples. Moreover, one of other interesting techniques, infrared microspectroscopy is widely used for chemical compound identification. Owing to the high brightness of synchrotron radiation, synchrotron based infrared microspectroscopy provides high spatial resolution, better signal to noise ratio and shorter data acquisition time than the conventional source. In my talk, the XAS and infrared microspectroscopy beamlines and their applications on advanced functional materials will be introduced in order to obtain the accuracy of their locally structural information which cause that such properties in these materials.

**Keywords:** advanced functional materials; Local structure; X-ray absorption spectroscopy; XANES; EXAFS; infrared microspectroscopy