

Opportunities and challenges at the Carbon edge: Nano-morphological characterization of organic photovoltaic thin films using soft x-rays

Sufal SWARAJ

Synchrotron SOLEIL. L'Orme des Merisiers Saint-Aubin - BP 48, F-91192 Gif-sur-Yvette cedex, FRANCE

ABSTRACT

Continuing research in the field of organic photovoltaics has imposed intense requirements on modern morphological characterization techniques. Such studies at the nanometer scale of these materials are becoming as important as their various optical and electronic studies. I will present how a multi-method approach using several soft x-ray based characterization techniques can be used to disentangle surface, bulk, interfacial and orientation information in these materials. I will be focusing on Scanning Transmission X-ray Microscopy (STXM), Resonant Soft X-ray scattering (RSoXS), Resonant Soft X-ray Reflectivity (RSoXR) and Polarized Resonant Soft X-ray Scattering (P-RSoXS). While STXM is quite well established for such investigations [1], some interesting strategies [2, 3] can be employed to use RSoXS, RSoXR and P-RSoXS near the Carbon K-edge to study these materials. I will show some examples to demonstrate these investigation strategies. I will briefly discuss some of the issues like sample damage and Carbon contamination that one encounters while working at the Carbon edge. In addition, I will briefly describe the beamlines (HERMES & SEXTANTS) at synchrotron SOLEIL where these investigations can be performed.

REFERENCES

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