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A retrospective view of synchrotron radiation in polymer science at ALBA and a dream for the future

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Scattering techniques have been widely used for studying the structural heterogeneity of soft condensed matter in general and polymers in particular. Simultaneous Small Angle X-ray Scattering (SAXS) and Wide Angle X-ray Scattering (WAXS) is a well suited technique for investigating phase changes or conformational rearrangements on a length scale ranging from 1 to 500 nm. Static or time resolved measurements can be performed with simultaneous SAXS and WAXS area detectors. Investigation of thin films at different length scales is also possible by using grazing incidence geometry, GISAXS and GIWAXS. Some examples of the application of these techniques, available at NCD-SWEET beamline, will be given: the study of structure-property relationship in fully biobased polymers for packaging¹, the investigation of nanostructured thin films², as well as the structure developed in polymers during “operando” 3-D printing³.

Finally, as a dream for ALBA II, it will be show how a Resonant Soft X-ray Scattering (RSoXS) beamline, devoted to soft condensed matter, can complement the scattering techniques available at ALBA⁴.

[1] G. Guidotti et al. ACS Sustainable Chem. Eng. 8, (2020) 9558–9568

[2] E. Gutiérrez-Fernández et al. Applied Surface Science 548 (2021) 149254

[3] T. Ezquerro et al. Polymer 249 (2022) 124827

[4] A. Rodríguez-Rodríguez et al. Physical Review Materials 2 (2018) 066003

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No

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