

## The Rigaku Oxford Diffraction *XtaLAB Synergy*: from Powder Analysis to Charge Density Studies and Protein Structure Solution.

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Since the merger of Rigaku and Oxford Diffraction in 2015, a number of new and innovative tools for X-ray diffraction have been developed, based on the universal goniometer: the ***XtaLAB Synergy*** X-ray diffractometers. The series include a single/dual wavelength microfocus sealed tube (the ***XtaLAB Synergy-S***), and a microfocus rotating anode (the single wavelength ***XtaLAB Synergy-R*** and dual wavelength ***XtaLAB Synergy-DW***).

The combination of a powerful microfocus X-ray beam (with a choice of Cu, Mo or Ag wavelength), with variable divergence, couple to a versatile full 4-circles goniometer and the direct detecting photon counting ***HyPix*** detectors allows for crystallographers to perform powder, small molecule and protein measurements to cover a wide range of experiments.

In this work, we present results for the following experiments performed with the microfocus sealed tube Cu/Mo ***XtaLAB Synergy-S***:

- Analysis of a powder mixture in which a minor phase of 0.8% relative weight of rutile was successfully detected.
- Charge density study of oxalic acid to 0.4 Å.
- Complete data collection to 0.837 Å on a crystal of chlorothiazide acid in space group P1.
- Structure solution of lysozyme by S-SAD phasing from a 1 hour data set collected on the curved photon counting detector, the HyPix-Arc150°.