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Advanced Micro-crystallography Single Crystal X-ray Diffraction Beamline at TPS

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Molecular and crystal structure are basic but always the key to understand physical and chemical properties. A dedicated small-molecule single-crystal X-ray diffraction beamline is therefore scheduled on phase-II beamline construction at Taiwan Photon Source. Undulator will be used as X-ray source to generate high brilliance X-ray. The energy of this beam line is tunable within 8-32 keV depending on requirement. Monochromatic mode and pink beam mode both will be available at this beamline for different purpose. The monochromatic beam mode will be selected by Double Crystal Monochromator (DCM) and the pink beam mode (with bandwidth $\sim 3\%$ or less) will be selected by Double Multilayer Monochromator (DMM). Two pairs of focusing mirrors (HFM and VFM) will be used to focus the beam size down to few microns in diameter at sample position. The end-stations will equip with four-axis diffractometer for data collection.

This beamline is designed for advanced crystallographic purpose, which is not only dedicated to structure determination which cannot or very difficult to be done by using in-house diffractometer, but also to determine structure at non-ambient conditions and advanced studies. The techniques used at this beamline will cover (1) Time-resolved dynamic structural study (2) Laue crystallography (3) High pressure single crystal crystallography (4) Photo-induced excited state structural study (5) Ultra-high resolution charge density analysis (6) Resonance diffraction (7) Single crystal gas/solvent absorption-desorption (8) Micro-crystal and large porous structure determination.

Keywords

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