

## High-throughput X-ray powder diffraction system consisting of multiple MYTHEN detectors at beamline BL02B2 of SPring-8

K. Sugimoto<sup>a,b</sup>, S. Kawaguchi<sup>a</sup>, M. Takemoto<sup>a</sup>

<sup>a</sup>Research & Utilization Division, Japan Synchrotron Radiation Research Institute, 1-1-1 Kouto, Sayo-gun Sayo-cho, Hyogo 679-5198, Japan

<sup>b</sup>Department of Chemistry, Kobe University, 1-1 Rokkodai-cho, Nada-ku, Kobe 657-8501 Japan

In this work, we developed an automatic X-ray powder diffraction system for high-throughput data collection at beamline BL02B2 of SPring-8, as shown in figure 1. The new X-ray powder diffraction system consists of six one-dimensional solid-state detectors (MYTHEN, Dectris Ltd), compact auto-sampler, wide-range temperature control systems, gas adsorption control system. In response to various materials science requirements, we developed unique data collection techniques and new attachments for *in-situ* experiments to reveal structural feature relating to physical properties. In order to perform high-throughput data collection, we also developed auto-sampler, which does not affect to temperature control and gas adsorption control systems. The auto-sampler is very useful for multiple samples, which the experimental condition can easily read from Excel file. We tested the performance of the developed measurement system using reference materials, as well as co-crystal, inorganic complexes and MOF complex. The test results revealed that the quality of the high-resolution powder diffraction data is sufficient not only for the Rietveld method, but also for *in-situ* measurement in various sample environments such as gas molecule adsorption and/or in dependence of temperature. We believe this developed system configuration will not only contribute to the analysis of functional complexes, including in high-throughput screens, but also allow for industrial investigations such as time-resolved experiments. In our presentation, we will talk about the details and the performance of new high-throughput X-ray powder diffraction system.

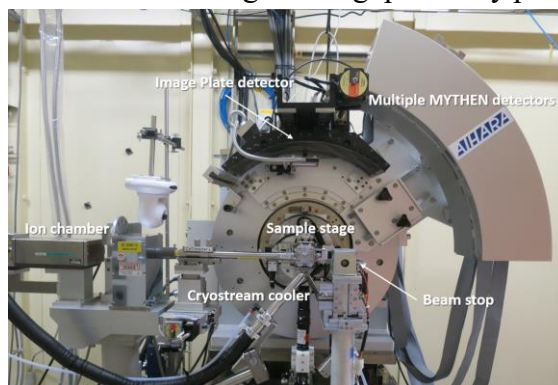


Figure 1. Photograph of the diffractometer at BL02B2/SPring-8.