

Application of the SOPHIAS Detector to Synchrotron Radiation X-ray Experiments

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The structural analysis for functional materials is one of studies which are recently very interested in application of synchrotron radiation science. With a low-emittance synchrotron ring, higher performance is required for an X-ray area detector used in experiments. A charge integrating type detector SOPHIAS, which was designed fitting to XFEL experiments, was developed by RIKEN based on Silicon-On-Insulator technology. The SOPHIAS detector has a 2157 times 891 pixel array consisted of 30 micro meter square pixels. The SOPHIAS is powerful tool in X-ray structural analysis because of its property of high definition and high dynamic range. The application of the SOPHIAS to synchrotron radiation experiments was started at Photon Factory, KEK (KEK/PF). Focusing to small angle X-ray scattering (SAXS) for block copolymers and X-ray diffraction for ferroelectrics, synchrotron radiation X-ray experiments were conducted by use of the SOPHIAS at KEK/PF. In the measurement of the SAXS for a poly(epsilon-caprolactone)-polybutadiene diblock copolymer, the SAXS pattern has complicated peak structure originated in Frank-Kasper sigma phase so that the fine pixel of the SOPHIAS was very important to resolve the peaks.

We will report the results of the experiments using the SOPHIAS.

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