# Test measurements of the Small Angle X-ray Scattering of Latex Particles for the Evaluation of BL40B2

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## Introduction

Polystyrene latex (PS-latex) is a very stable polymer which has a spherical shape with narrow size distribution. Since it produces many fine peaks arising from the form factor of a sphere, it is often used for the evaluation of optics and detectors. For the use of solution scattering, the identical detection between sample and buffer solutions is essential. Imaging plate, however, is supposed to have the difficulties in control of such identical detection, because of complicated fading behavior of phosphore on imaging plate. We evaluated the detector by latex.

## Materials and Methods

PS-latex dispersed in surfactant-free was purchased from Sekisui Co. Ltd. Its diameter distribution has been estimated to be 1250 Å with a half width of 43 Å [1]. In order to enhance the contrast, it was dispersed in 52.5 wt% glycerol. The concentration of latex was 50 mg/ml. The collection of scattering data was done by IP situated at the beamline (R-AXIS-IV$^{++}$, RIGAKU). The wavelength was chosen at 7, 12 and 17 keV, respectively. The camera length was 1125 mm. After scaling of each image by incident X-rays, circular averaging of image and subtraction of buffer scattering were done by the similar method as described previously [1].

## Results and discussion

The subtraction of sample and buffer image has been all successful irrespective of wave length. Figure 1 shows one of the representative power-law dependency of latex scattering. Since PS-latex has a smooth surface, it should follow $S^{-4}$ law. It should be noted that 11 peaks could be resolved with 1.1 m camera at 12keV. As a result wide angular range can be covered without loosing fine structures observed in small-angle scattering region.

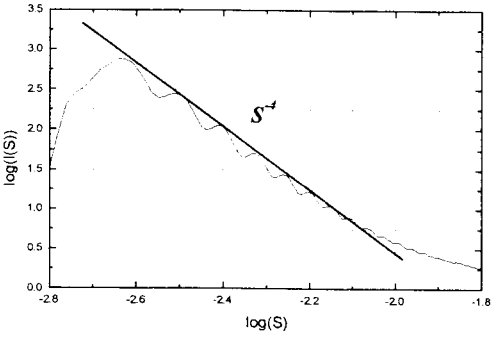


Fig.1 Power law dependency of latex solutions.

Reference

[1] T.Fujisawa, Y.Inoko, N.Yagi, *J.Synchrtron Rad.* (1999) **6**, 1106-1114.