Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

On the evaluation of the absolute photon energy of Cu$K\alpha,\beta$ lines using 4-crystal X –ray spectrometer[1] YOSHIAKI ITO, Kyoto University, TATSUNORI TOCHIO, Kobe University, SEI FUKUSHIMA, National Institute of Materials Sciences — A 4-crystal X-ray spectrometer was designed based on a 2-crystal X-ray spectrometer to be able to perform the absolute measurement of Bragg angle. This basic thought based on 2 crystals dates back to the times to A.Compton etc.[Sci.Rev.Inst.,**2**,365(1931), Phys.Rev.**47**,882(1935)]. Because a distortion to give the crystal by the adhesive when a crystal was glued, greatly affected the X-rays profile, we changed it to the channel cut crystal without a free distortion as for having made each crystal of 2-crystal a channel cut. The influence of the foot in the spectral profile is more suppressed because four times of reflections reflect it. It is a high resolution so as not to need to consider instrumental function by the reflection degree that a specific atomic analysis can be executed with the chemical state which it is possible for making the placement of the 4-crystal (+,+) setting [Phys.Rev.**49**,14(1936), Phys.Rev.A65,042502(2002)]. This type of spectrum device is first time in the world. Because the absolute measurement of 2θ angles is enabled by (+,-) and (+,+) setting from the center of gravity position of the rocking curve and the center of gravity position of the X-rays spectrum, we may measure the absolute value of the X-ray photon energy. Because we evaluated the energy of the Cu $K\alpha,\beta$ lines, we report it.

[1]We acknowledge financial support for the measurements of a part of the data by the REXDAB collaboration that was initiated within the International Fundamental Parameter Initiative.

Yoshiaki Ito
Kyoto University

Date submitted: 24 Oct 2016 Electronic form version 1.4