Poster Presentation

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X-Ray Diffraction from Magnetically Oriented Microcrystal Suspension

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A three dimensionally magnetically oriented microcrystal array (3D-MOMA) is attractive to determination of a crystal structure as well as a molecular structure because it does not require a single crystal with sufficient size and quality for diffraction studies. We have developed a novel method to fabricate 3D-MOMA and determined several crystal structures using the 3D-MOMAs[1],[2]. However, the structure determination through MOMA requires a solidification treatment with UV curable monomer prior to X-ray diffraction experiment. We have developed a new X-ray diffractometer equipped with a magnetic field generator, which makes it possible to collect diffraction data without the solidification treatment. In this poster, we describe X-ray diffraction analyses of a magnetically oriented microcrystal suspension (MOMS) of L-alanine without the solidification treatment. A suspension of L-alanine microcrystals was poured in a glass capillary and rotated at a constant speed in a magnetic circuit attached in the X-ray diffractometer. Then, diffraction images were collected every 60 seconds. In the initial phase, the diffraction pattern showed a broad shape similar to that from a powder sample. As time goes on, diffraction patterns have gradually changed to single-crystal like patterns. After 2 hours, the shape of diffraction spots became as sharp as that of a single crystal. This observation shows that the microcrystals are oriented in the same direction. Owing to the improvement of the magnetic circuit and X-ray diffractometer, the quality of the diffraction has been greatly improved compared to that reported previously[3]. Further details of the analyses will be shown in the poster.

[1] *T. Kimura, C. Chang, F. Kimura et al. J. Appl. Cryst., 2009, 42, 535,* ***[2]*** *F. Kimura, K. Mizutani, T. Kimura et al. Cryst. Growth Des., 2011, 11, 12,* ***[3]*** *K. Matsumoto, F. Kimura, S. Tsukui, et al. Cryst. Growth Des., 2011, 11, 945*

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