

Observation of admolecule on the crystal surface in liquid by non-contact atomic force microscopy

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The highest resolution AFM images are obtained by non-contact atomic force microscopy (NC-AFM). Fukuma et al. (2005) succeeded in obtaining true atomic resolution images by NC-AFM in spite of the liquid environment [1]. We are interested in the crystal growth process. However, previous NC-AFM studies were only about insoluble crystals in liquid. NC-AFM is not good at investigating the moving surface because NC-AFM is a very sensitive method for detecting weak interaction force. Therefore, we tried to observe several soluble crystals in liquid by NC-AFM at first.

At first, we observed tetragonal lysozyme (110) face in saturated solution by using homebuilt Non-Contact AFM (NC-AFM). We could observe individual molecules on the lysozyme (110) face in liquid for the first time and determine the crystallographic position of each molecule [2]. In addition, we also observed admolecule and point defect on the lysozyme surface in liquid.

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[1] T. Fukuma et al., Appl. Phys. Lett. 87, 034101 (2005).

[2] K. Nagashima et al., J. Vac. Sci. Technol. B 28, C4C11 (2010).

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