Visualization of molecular recognition using scanning probe microscopy

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The importance of scanning-probe microscopy (SPM) is comparable to that of electron microscopy (EM) and optical microscopy (OM). SPM measures the near-field interaction between the scanning-probe tip and the sample surface that lies beneath it. A member of the SPM family, atomic force microscopy (AFM) including scanning near-field optical/atomic force microscopy (SNOM/AFM), has been of interest to various physical, chemical, material, biological, and electrochemical researchers, and highly functional instruments have been developed. This interest may be because of its applicability for samples in in situ environments. In recent years, our group is visualizing molecular recognition phenomena of various materials. This effort will helpful to understand the phenomena itself, and give us the analysis for efficient process techniques. In the presentation, I will give some basic information for the AFM and SNOM/AFM techniques, and discuss the detection and visualization of molecular recognition phenomena for biological and inorganic materials using SPM.