

MIS020-04

Room:301A

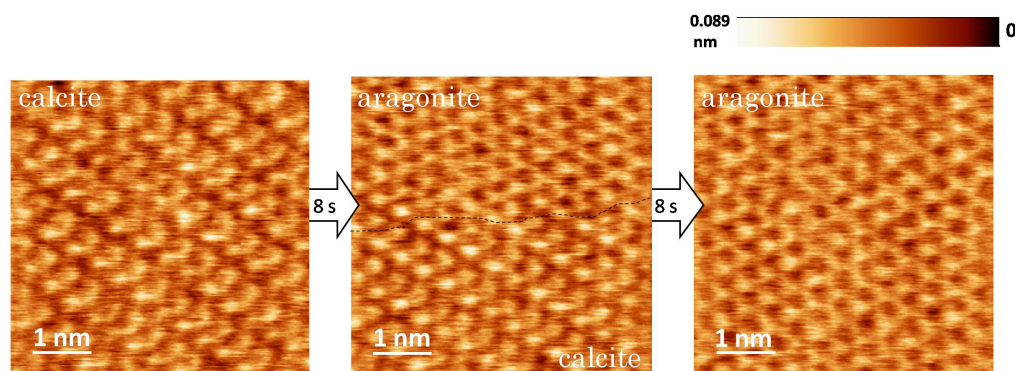
Time:May 24 15:30-15:45

Atomic in situ investigation of aragonite formation by FM-AFM

Yuki Araki^{1*}, Katsuo Tsukamoto¹, Mihoko Maruyama², Tomoyuki Miyashita³, Noriaki Oyabu⁴, Kei Kobayashi⁴, Hirohumi Yamada⁴

¹Sci., Tohoku Univ., ²Eng., Osaka Univ., ³Biology Sci. and Tech., Kinki Univ., ⁴Eng., Kyoto Univ.

The crystallization by the interactions between organic materials and inorganic minerals is called "biomineralization". Although aragonite is metastable at normal temperature and pressure, some bivalve shells contain prismatic calcite and nacreous aragonite simultaneously by using special proteins (Falini et al., 1996, Belcher et al., 1996). We have done in situ observation of aragonite formation in atomic resolution on calcite seed crystal in the solution containing the synthetic polypeptide, which imitates the sequence of amino acids in the special proteins (Takagi and Miyashita, 2010). As a result, it was confirmed that calcite transformed to aragonite in the surface layer of calcite seed crystal, and the synthetic polypeptide adsorbed along calcium sequence of calcite [010]. Our results strongly suggest there is the new model of aragonite formation under normal condition.



Keywords: biomineralization, the synthetic polypeptide, Frequency Modulation AFM