Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Magnetic Thin Films of Inorganic Nanosheets
TAKASHI YAMAMOTO, HIROAKI NAMBA, YASUAKI EINAGA, Department of Chemistry, Keio University, JST-CREST TEAM —
Molecule-based magnets have been fascinating materials because of the potential applications in information storage, electronic and spintronic devices. However, such applications would require arraying the active materials on a substrate or interfacing with other components. Here, we focus on fabricating multi-functional magnetic films using inorganic nanosheets as a building block. The thin films could be prepared by the modified Langmuir-Blodgett, LB, technique or the layer-by-layer, LbL, method, which are representative wet-processings for film preparation. As the magnetic LB film, we chose semiconductive titania nanosheets and magnetic Prussian Blue. Upon band gap excitation of titania nanosheets, electron injection into Prussian Blue was achieved with scavenging interlayer water molecules, leading to photoreduction to Prussian White. As the magnetic LbL film, we chose magnetic layered double hydroxide, LDH, nanosheets and non-magnetic smectite nanosheets. In powdered LDH, a coercivity increased with expanding the interlayer spacing. On the other hand, despite the larger interlayer spacing for the LbL film, a coercivity was less than that of the comparative powdered LDH. It is indicated LDH nanosheets are integrated in an anisotropic manner in the LbL films.

Takashi Yamamoto
Department of Chemistry, Keio University

Date submitted: 10 Nov 2011 Electronic form version 1.4