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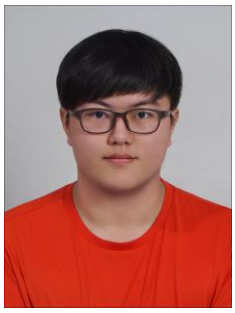

Title of the presentation

Anisotropic growth of layered double hydroxides on planar aluminum or spherical alumina substrates

Anisotropic assembly of layered double hydroxides (LDH) flakes were directly obtained either on flat aluminum plates or spherical alumina balls via controlled surface crystal growth. The strategy relies on controlled release of trivalent aluminum ions from the substrate, enabling in-situ crystallize into LDH sheets on the surface. On planar aluminum plate, LDH nanosheets were found to grow in a vertical alignment upon reaction with Mg^{2+} divalent cations, OH^- anions and substrate-derived Al^{3+} trivalent cations. The calcination and rehydration, so called, reconstruction dramatically increased surface roughness of vertically grown LDH to generate lotus-effect hydrophobicity. In order to grow LDH on spherical alumina, the surface was pretreated with alkaline solution to create nucleation sites. Subsequent urea-assisted hydrothermal synthesis under the presence of Mg^{2+} source produced uniform LDH coverage with sand-rose architectures. Scanning electron microscopy and energy-dispersive X-ray spectroscopy validated the formation of randomly arranged LDH nanosheets on both planar aluminum substrate and uniform sand-rose LDH structures on spherical alumina balls. These results confirmed that controlled surface crystal growth yields distinct anisotropic LDH coatings on both substrate types.

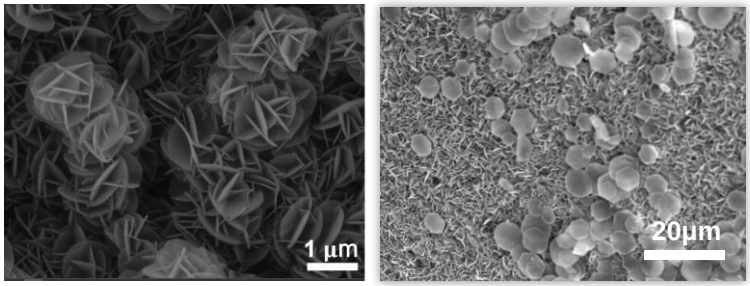

Figure 1. Scanning electron microscopy images of LDHs on Al plate and alumina balls