

Abstract Submitted
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Development of Multi-functional 2D Layered Double Hydroxides (LDHs). ASHTAMI JAYAKUMAR, LILLY SCHAFFER, MAGGIE PAULOSE, CHANDRA MOHAN, OOMMAN VARGHESE, University of Houston — Layered double hydroxides (LDHs) are interesting two-dimensional (2D) clay nanomaterials that possess exceptional functionalities appropriate for a range of applications including electrocatalysis, photocatalysis, drug delivery, immune therapy and bone tissue engineering. LDHs $[[M_{1-x}^{2+}M_x^{3+}(\text{OH})_2]^{x+}[A_{x/n}]^{n-} \cdot m\text{H}_2\text{O}]$ are sensitive towards the fabrication conditions and elemental combinations. One of the major hurdles in LDH development is to control tendency to grow into platelets of larger size and to exist in wide size distribution. We have successfully controlled the growth dynamics of LDHs by tuning the nucleation and hydrothermal growth conditions and fabricated the hexagonal platelet structured LDHs with narrow size distribution. The fabricated LDHs of different compositions showed significant potential as electrocatalysts for hydrogen generation via water splitting and/or for immunotherapy applications. In this presentation, we discuss the performance of different LDHs in these applications and the influence of growth conditions in controlling the size distribution and morphology.

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