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## Layered double hydroxide of Cd-Al/C for the Mineralization and De-coloration of Dyes in Solar and Visible Light Exposure

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### Abstract

Cd-Al/C layered double hydroxide (Cd-Al/C-LDH) and Cd-Sb/C nanocatalyst are reported here for the decoloration and mineralization of organic dyes. These catalysts were largely characterized by FESEM, EDS, XRD, FTIR, XPS, PL and DRS. The diffuse reflectance data showed a band gap at 2.92 and 2.983 eV for Cd-Al/C-LDH and Cd-Sb/C respectively. The band gap suggested that both catalysts work well in visible range. The photoluminescence spectra indicated a peak at 623 nm for both the catalysts which further support the effectiveness of the respective catalyst in visible range. Both catalysts also showed good recyclability and durability till 4th cycle. Five dyes, acridine orange (AO), malachite green (MG), crystal violet (CV), congo red (CR) and methyl orange (MO) were used in this experiment. Various parameters of different light intensity such as visible, ultraviolet, sunlight and dark condition are observed for the de-coloration of these dyes. The de-coloration phenomenon was proceeded through adsorption assisted phot-degradation. The low cost, abundant nature, good recyclability and better dye removal efficiency make these catalysts suitable candidates for the de-coloration and mineralization of organic dyes.

### Keywords

**KeyWords Plus:** LOW-COST ADSORBENTS; PHOTOCATALYTIC DEGRADATION; REACTIVE DYES; REMOVAL; ADSORPTION; WATER; REMEDIATION; DYESTUFFS; EFFLUENTS; INDUSTRY

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