

## High efficient photocatalyst based on calcined functionalized ZnAl LDH for the photodegradation of phenol

G. Romero Ortiz <sup>a</sup>, L. Lartundo Rojas<sup>c</sup>, V. Suárez<sup>a,b</sup> and A. Mantilla<sup>a</sup>.

<sup>a</sup>Instituto Politécnico Nacional, CICATA-Legaria, Av. Legaria No 694, México 11500, D.F., México.

<sup>b</sup>CONACyT Research Fellow Universidad Autónoma Metropolitana Iztapalapa, Departamento de Química, ECOCATAL. Av. San Rafael Atlixco No. 186, C.P. 09340 México D.F., México.

<sup>c</sup>Instituto Politécnico Nacional, CNMN, Luis Enrique Erro s/n, México, D.F.

Hydrotalcites like materials (double layered hydroxides) were synthesized by the coprecipitation method, using SDS as an additive. Both solids (with and without SDS) were calcined at 400°C in order to obtain the ZnAl mixed oxides. The semiconductor properties was measured and the photocatalytic activity was evaluated in the photodegradation of phenol, using UV light as the source of irradiation (254 nm). XRD, IR, XPS and UV spectroscopies give evidence of sulphate and sulfide groups in the hydrotalcite synthesized with SDS, showing two bands corresponding to sulphate and sulfide groups in the IR spectra, as well as zinc and aluminium sulphates from the analysis with XPS technique. On the other hand, an increase in the c parameter value, calculated from the XRD spectra, indicate the presence of SDS intercalated in the interlayered region. The bandgap values, calculated from the UV analysis, showed a decrease in the material modified with SDS, in comparison with the bare ZnAl LDH (from 3.2 to 3.0 eV). The photodegradation and mineralization of phenol was increased in 20% when the LDH with SDS was employed.

**Keywords:** Photocatalysis, functionalized LDH, photodegradation, phenol

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**Presenting authors email:** tomitzi\_21@hotmail.com