Degradation of 2,4-dichloridephenol from wastewater on SnO_2 – montmorillonite nanocomposites

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Recently, attention has been given to the use clays, microporous and mesoporous materials with special properties and features in environmental photocatalysis. Successfully used in the degradation and mineralization of many organic pollutants, heterogeneous photocatalysis, is based on irradiation of a catalyst, usually a semiconductor, which through photoexcitation, leads to the formation of electron donor sites (reducing sites) and some electron acceptor places (oxidizing sites).

It is known that tin dioxide is a versatile material, applicable in many physico-chemical processes, being one of the most intensively studied semiconductors.

In this study the SnO_2 – clay nanocomposites having photocatalytic activity in terms of mineralization of 2,4-phenol dichloride from wastewater were analysed. These studies have followed a performance evaluation of catalysts synthesized in the mineralization of 2,4-phenol dichloride, which is why the initial parameters: concentration of 2,4-dichloridephenol, and hydrogen peroxide, as well as the solution pH, temperature were kept constant.

In figure 1 a comparative study of evolution of degree of mineralization in time on synthesized catalysts, is presented.

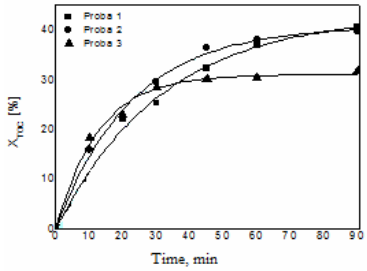

Figure 1. Time dependence of the degree of mineralization of 2,4- phenol dichloride: duration of balance determining -30 min, 10 mM H_2O_2

Although at certain moments/phases of the process, the degree of mineralization achieved in the presence of these catalysts has been higher at 90 min., it is noticed that its values were very close. In case of sample 1, whose concentration of SnO_2 is greater efficiency was significantly higher than other catalysts, the degree of mineralization being 40.63%, at 90 min.

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