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## PHENOL DEGRADATION IN WATER THROUGH A HETEROGENEOUS PHOTO-FENTON PROCESS

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### Abstract

A new photo-Fenton catalyst has been manufactured from synthetic layered clay laponite (Laponite RD) by the pillaring technique. Eight different catalyst samples were prepared: four without thermal aging (WTA) calcined at 523 °K, 623 °K, 723 °K and 823 °K, and other four with thermal aging (TA) calcined at the same temperatures. The activity of the TA- 623 sample was evaluated in the phenol degradation by the photo-Fenton process. The influence of five important operating factors has been studied experimentally: the wavelength of the light source (UV-C and UV-A); catalyst dose (0 to 2 g/L), initial phenol concentration (0.5 to 1.5 mM), hydrogen peroxide initial concentration (20 to 100 mM) and the initial solution pH (2.5 to 3.5) at 303 K. The results have shown that the almost complete conversion was possible, after only 5 minutes, under the following operating conditions: a low pressure mercury lamp as source of UV-C of 254 nm; pH3; a dose of 1 g catalyst/L, a hydrogen peroxide concentration of 50 mM for a solution containing 1mM phenol, at 303 K.

*Key words:* phenol degradation, Fe- Lap-RD catalyst, photo-Fenton, kinetic experiments, factor influence

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