

## COMPARATIVE STUDY OF PHENOLIC COMPOUNDS MIXTURES PHOTOCATALYTIC DEGRADATION

*J. Araña, V. M. Rodríguez López, E. Pulido Melián, M. I. Suárez Reyes, J. M. Doña  
Rodríguez and O. González Díaz*

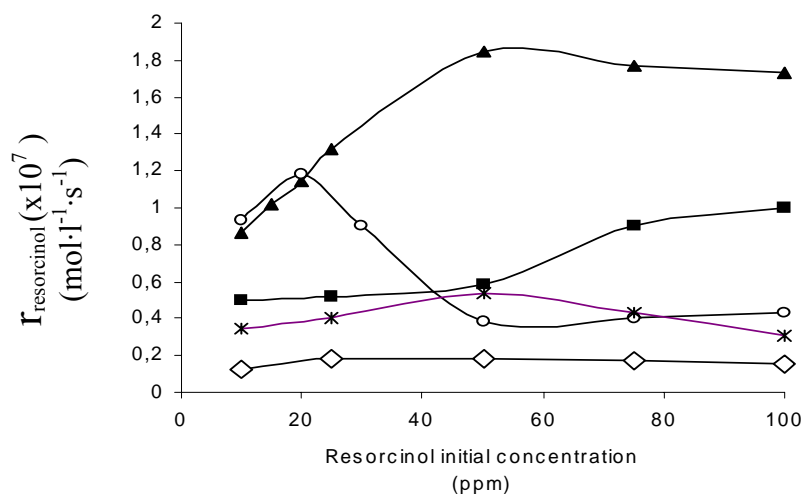
Fotocatálisis y Electroquímica Aplicada al Medio-Ambiente (FEAM). Unidad Asociada al CSIC. CIDIA (Depto. de Química), Edificio del Parque Científico Tecnológico, Campus Universitario de Tafira, 35017, Las Palmas, España. UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA. Tlf. +34-928-45-72-99, Fax + 34-928-45-73.97. Email: jaranaesp@hotmail.com

### Abstract

The application of photocatalytic techniques to real wastes can be hampered by the presence of interfering species. In fact, a pollutant can show a completely different photocatalytic behaviour when found in mixtures, not only by possible interactions among other species but also by competence by photoactive centers [1-6].

In this work, the photocatalytic behaviour of couples of phenolics (catechol, resorcinol, phenol, m-cresol and o-cresol) has been studied at different initial substrate concentrations (10-100), pH 5 and using Degussa P-25 TiO<sub>2</sub>. Adsorption studies have been carried out to test possible competence for adsorption centres and its effect on photocatalytic degradation.

Figure 1 illustrates the effect of the presence of different phenolics on resorcinol initial degradation rate.



**Figure 1.** Resorcinol initial degradation rate in presence of catechol  $\diamond$ , phenol  $\blacksquare$ , m-cresol  $\bullet$ , o-cresol  $\times$  and resorcinol alone  $\blacktriangle$ . Initial concentrations are the same for all the compounds and experiments.

In all the studied mixtures, the presence of catechol and phenol provides the strongest degradation rate reductions, being lower in the former. The effect of the other phenolics varies according to mixture and initial concentration.



The photocatalyst behaviour in these mixtures has been evaluated taking into account the following items:

- i) the proposed degradation mechanisms for the studied compounds
- ii) adsorption centres,
- iii) photoactive centres,
- iv) Interaction type of each phenolic as determined by FTIR studies from individual compounds and their mixtures.

## References

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