

This paper reports the results of a study on the titanium dioxide Wackherr's "Oxyde de titane standard", which shows very interesting photocatalytic activity. Produced for cosmetic purposes as a white pigment, its features make it very interesting in the field of heterogeneous photocatalysis. The results obtained with this photocatalyst are compared with the behaviour of the well-studied and widely used TiO₂ Degussa P25 under the same conditions. In particular, the TiO₂ Wackherr induces relevantly faster phenol degradation than P25 when high photocatalyst loading is used (up to 2.00 g l⁻¹), as phenol degradation rate in the presence of TiO₂ Wackherr continues to increase with increasing photocatalyst loading. This is most likely due to the lower radiation scattering in the UV region of TiO₂ Wackherr when compared with Degussa P25, which is linked with the higher particle size of TiO₂ Wackherr. The initial phenol degradation rate by TiO₂ Wackherr as a function of phenol concentration has a maximum for [phenol] $\approx 3 \times 10^{-4}$ M, and decreases for higher concentration values. The addition of fluoride ions to TiO₂ Wackherr at pH 3.7 increases phenol degradation rate, as already found for Degussa P25. The increase is more relevant for higher phenol concentration values and makes the maximum as a function of phenol concentration to disappear. Comparable results are also obtained when benzoic acid is used as a substrate, with some differences from phenol that can be accounted for by benzoic acid more strongly interacting with the surface. The use of TiO₂ Wackherr in heterogeneous photocatalysis can be desirable when high photocatalyst loading is required.