Determining the role of pore size in carbons for the photocatalytic degradation of organic pollutants under solar irradiation

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Synthetic carbons with very well controlled porous structure were obtained from polymerization or resorcinol and formaldehyde. Carbons with tailored pore diameter from 5 to 100 nm were produced by varying the synthesis conditions, mainly amount of precursors and pH of the precursor solution. The surface chemistry is analogous among all carbons; as a consequence the different behavior should be only due to their pore structure. The role of the mean pore size on the capacity of adsorption and photodegradation of yellow-5 was evaluated. It was observed that the mean pore diameter influences on the adsorption kinetic constants besides on the surface density of the molecules adsorbed. This is traduced in different photodegradation rates, being the maxima photocatalytic activity in samples with pores of ca. 20 nm. In this work, it is presented and discussed the use of synthetic carbons for evaluating and optimizing properties of carbon materials for photocatalytic degradation of organic pollutants.