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## **LIVRO DE RESUMOS**



SOCIEDADE PORTUGUESA DE QUÍMICA

**ORANGE II REMOVAL BY CATALYTIC WET PEROXIDE  
OXIDATION USING ACTIVATED CARBON XEROGELS****Maria T. Pinho<sup>a\*</sup>, Adrián M.T. Silva<sup>a</sup>, Nady A. Fathy<sup>b</sup>, Amina A. Attia<sup>b</sup>,  
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Orange II is a synthetic dye widely employed in the textile industry and responsible for serious environmental concerns. Dyes like this urge the development of new technologies for the treatment of wastewaters generated in this industrial activity. Those include catalytic wet peroxide oxidation (CWPO), which is an advanced oxidation process (AOP) based on the generation of hydroxyl radicals (HO<sup>•</sup>) from hydrogen peroxide with the aid of a suitable catalyst [1].

In this work, different activated carbon xerogels were first produced from an organic xerogel (RFX) synthesised by polycondensation of resorcinol with formaldehyde, considering the following procedures: (a) chemical impregnation with H<sub>3</sub>PO<sub>4</sub> at 773 K (ACX-P); (b) impregnation with monoethanolamine at 773 K (ACX-MEA); and (c) alkali activation with dry KOH at 1073 K using a KOH/RFX mass ratio of 1:1 (ACX-K). Composites from activated-carbon-xerogel/chitosan were finally synthesized by treatment of the ACX materials with oxalic acid, followed by impregnation with chitosan. All the materials were tested in the removal of Orange II by adsorption and by CWPO, following the procedures described elsewhere [2]. Briefly, the experiments were performed in a batch glass reactor, with an Orange II concentration of 100 mg L<sup>-1</sup> and the following operating conditions: T = 323 K, pH = 3, adsorbent/catalyst load = 0.2 g L<sup>-1</sup> and, in CWPO runs, [H<sub>2</sub>O<sub>2</sub>] = 34.6 mmol L<sup>-1</sup>. The highest activity in CWPO was obtained with the ACX-K material before impregnation with chitosan, the Orange II removal increasing from 59% (pure adsorption) to 71% by CWPO.

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[2] R.S. Ribeiro, N.A. Fathy, A.A. Attia, A.M.T. Silva, J.L. Faria, H.T. Gomes, *Chemical Engineering Journal* 195-196 (2012) 112-121.