

## **Enhancement the photocatalytic activity of Zinc Oxide surface by combination with Functionalized and non-Functionalized Activated Carbon**

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**Abstract :** The current study, describes synthesis and functionalization of activated carbon that is derived from Iraqi date palm seeds and its combination with zinc oxide nanoparticles to yield activated carbon/zinc oxide (AC/ZnO), and functionalized activated carbon /zinc oxide (FAC/ZnO). These materials were characterized using powder X-rays diffraction (PXRD), Fourier transform infrared spectroscopy (FTIR) and specific surface area (BET). The photocatalytic activity of these materials was investigated by following removal of Celestin blue b dye (CBB) from textile wastewaters. Besides that, impact of different reaction parameters were investigated such as effect of the temperature, pH, contact time, as well as dosage effect. Activation energy for dye removal was calculated according to Arrhenius equation and it was around 27.71 kJ/mol. It was found that, the photocatalytic activity of these materials towards dyes removal was as follows: AC/ZnO > FAC/ZnO > ZnO.

**Keywords :** Activated carbon, Activated carbon/ZnO, Textile dye removal over activated carbon., Adsorption of Celestin blue b, functionalized activated carbon.

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