



## Removal of tetracycline and rhodamine from aqueous systems by pristine biochar derived from poultry manure

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### ABSTRACT

In this work, we investigated the potential of pristine biochar (obtained from poultry manure by pyrolysis at 725°C in a laboratory pyrolysis reactor under N<sub>2</sub> environment) as an efficient adsorbent for removing tetracycline (TC) and rhodamine 6G (R6G) from aqueous solutions. Microscopic and spectroscopic analyses demonstrated a developed surface of the investigated biochar free from toxic organic compounds that could form within the annealing. The removal of TC and R6G was analyzed with UV-vis spectrometry in the function of the pH, ionic strength, and adsorbent dosage. The maximal adsorption capacity for TC and R6G is 65 and 63 mg g<sup>-1</sup>, respectively, indicating that pristine biochar from poultry manure has an excellent adsorption ability for both compounds demonstrating its high potential for removing various compounds of this type from water media. The enhanced adsorption on the investigated biochar is mainly controlled by the strong  $\pi$ - $\pi$  and  $n$ - $\pi$  interactions between the surface of the biochar and the two contaminants. The investigated poultry manure derived biochar can be a promising “green”, sustainable and carbon-rich material for low-cost and facile environmental applications, including the removal of contaminants from municipal wastewater.

*Keywords:* Pristine biochar; Poultry manure; Wastewater treatment; Tetracycline; Rhodamine 6G

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