



EVALUATION OF ACETAMINOPHEN CONCENTRATION IN ADSORPTION STUDIES WITH RESIDUAL CARBON BLACK

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INTRODUCTION

The presence of microcontaminants in aquatic environments, specially drugs, can cause contamination in different organisms, such as reproductive damage, behavioral changes, and inhibition of cell proliferation (Escher et al. 2011, Water Res.). Among these drugs, one of the most consumed is Paracetamol, that due to inappropriate disposal has been constantly found in water resources (García-Mateos, 2015, Chem Eng J). Removal of these compounds can be accomplished by adsorption studies. More specifically, the adsorbent used in the present study is the carbon black, a residue from a tire pyrolysis process, supplied by RODE Company. In a previously study, done by our research group, the carbon black presented a removal of 40 % for a solution with a paracetamol concentration of 50 mg/L. In order to further understand the use of this residue as an adsorbent, in this study, was investigated the effect of concentration the adsorbate in batch system.

MATERIAL AND METHODS

The adsorbent used, the residue carbon black, went through a thermal treatment, a muffle process (400 °C/30 min). Previously, the adsorbent was washed with distilled (100 g/50 mL). The kinetic study was performed for two different concentrations of a paracetamol solution (15 and 25 mg/L). In both cases 100 mg of

carbon black were used and 20 mL of each solution. The contact time was 120 minutes. The concentration of paracetamol after the adsorption was determined using a spectrophotometer UV 1800 in a wavelength of 240 nm, a calibration curve had been previously built.

RESULTS

The removal percentage of paracetamol for the 25 mg/L and the 15 mg/L solutions were of 56 % and 65 % respectively. The results found indicate an increase in the efficiency of the adsorbent when being used for the adsorption of solutions of a smaller concentration. This can also be observed in the previous study done by our research group, in which a removal of 40% was obtained for a concentration of 50 mg/L.

CONCLUSIONS

The results contribute to the application of carbon black as adsorbent, showing its potential in adsorption processes.

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