



## ORANGE POMACE MODIFIED AS ECO-FRIENDLY BIOSORBENT

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### ABSTRACT

Orange pomace is an organic material that has a high lignocellulosic fraction, and can be reused as raw material for the development of biosorbents, in order to remove aquatic contaminants[1]. Thus, the present work aimed to evaluate the potential of orange pomace modified by reactive extrusion as a biosorbent of dyes, in order to enable a new sustainable and low-cost material for bioremediation processes. Initially, the dried and ground orange pomace was subjected to a process of removal of soluble fibers, in order to separate the pectin from the lignocellulosic portion, in order to verify the behavior of the isolated lignocellulose. The fraction of insoluble fibers was then extruded with 1% NaOH (w/w) at 120°C, finally obtaining lignocellulose from orange pomace (OBL). The masses of 5, 10, 20, 30 and 40 mg of OBL were analyzed in triplicate in 10 mL of a solution of 10 mg/L Methylene Blue (AM) in 130 rpm stirring at 25°C for 24 hours. The final concentration of AM was determined by UV-Vis spectroscopy. The results show that the best adsorption capacity ( $Q_e$ ) occurs at 5 mg (15.6 mg/g) of OBL, observing a drastic drop of  $Q_e$  to 40 mg of OBL (2.14 mg/g). This behavior is due to the increase in the number of available pores with the increase in mass, resulting in unused adsorption sites. Thus, the best mass to continue the OBL adsorption tests in AM is 5 mg, since it presents the best  $Q_e$ . It is concluded that OBL is a promising adsorbent for AM removal, and more tests are needed to find the ideal adsorption conditions, as well as the mechanism in which it occurs, making it possible to expand the applications of this material.

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