Single-Step Pyrolysis of Phosphoric Acid-Activated Bagasse as a Sustainable Method of Adsorption of the Antibiotic Ciprofloxacin

Diaz, Liz (School: H.L. Bourgeois High School)

Unethical and inadequate regulations for waste and antibiotic disposal has led to the contamination of numerous bodies of water in India. In particular, a member of the most prominent class of antibiotics, has been found in India's lakes and rivers. A possible solution is adsorption of this drug via a powerful adsorbent. In order to explore this method, activated carbon, and efficient adsorbent, was produced from chemically-activated bagasse because of its abundance in India, making it a sustainable source of biomass. Solutions of Ciprofloxacin were exposed to activated carbon treated with phosphoric acid, untreated activated carbon, and uncharred bagasse. I hypothesized that the phosphoric acid-activated carbon would be efficient in reducing the concentration of Ciprofloxacin, and that it would lower the drug concentration more so than the other experimental groups. According to my results, Ciprofloxacin adsorption was possible in the experimental groups that were exposed to untreated and treated bagasse. The solutions exposed to uncharred bagasse experienced an increase in concentration, likely from water absorption rather than drug adsorption. The group with the highest adsorption of Ciprofloxacin was the group with phosphoric acid-activated bagasse. By advancing this study to increase the adsorption of Ciprofloxacin, it may developed into a possible method of controlling the environmental exposure to this drug.

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