

USE OF BIOCHAR PRODUCED FROM TEA RESIDUE TO REMOVE CARBOFURAN FROM WATER

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Excessive use of pesticides has led to the soil and water pollution. Carbofuran has been widely used in many countries including Sri Lanka. The objective of the present investigation was to develop biochar from disposable tea residue for the removal of carbofuran from water. Locally collected tea waste was pyrolyzed at 300 (TWBC300) and 700 °C (TWBC700) and they were characterized for pH, EC, moisture, mobile matter, resident matter and ash contents. Sorption experiments were conducted at different pH levels using 5-100 mg/L carbofuran concentrations and 1.5 g/L biochar dose. Ash content, pH, EC, and resident matter were higher in TWBC700 while CEC and mobile matter content were higher in TWBC300. This may be due to the secondary decomposition and alkali residues formation at 700°C. In the pH range of 3-5, carbofuran adsorption was increased. The maximum adsorption of carbofuran occurred at pH 5 and then it decreased. Carbofuran removal was higher by TWBC700 than TWBC300. Adsorption capacity increased with rise in carbofuran concentration. Maximum adsorption capacity of 19 mg/g and 15 mg/g was achieved by TWBC700 and TWBC300, respectively. The biochar developed from tea residue could be used for remediation of contaminated water with carbofuran.

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