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APPLICATION OF PEACH SHELLS FOR THE REMOVAL OF METHYLENE BLUE AND BRILLIANT GREEN

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Increased industrial, agricultural and domestic activities resulted in the production of large amount of wastewater containing a number of toxic materials which continuously polluting the available fresh water. Sorption is an effective method for water decontamination. Various types of pollutants such as metal ions, dyes, and a number of other organic and inorganic compounds and bio-organisms could be removed by different types of sorbents. Important properties of good sorbent material are high specific surface area and fast kinetics for the removal of pollutants. Natural materials such as oil palm fibers and shells, waste apricot and pitch, olive-seeds waste, peach stones, almond shells, walnut shells, hazelnut shells, kaolin, bentonite, zeolites, coal, etc., possess large capacities for removing of the water pollutants. The main advantages of these materials are wide availability, low cost and environmental safety.

The peach shells (PS) were used as the raw material for removing of non-degradable toxic dyes from water solutions. Methylene blue (MB) and brilliant green (BG) were used as representatives of dyes which commonly are pollutant from the textile industry. The peach shells were milled in vibromill and sieved to desired sizes: (1) 100–500 μm , and (2) < 100 μm . The phase composition of the prepared particles fractions was identified by XRD. The BET specific surface area was determined from N_2 adsorption/desorption experiments. The particles morphology was characterized by SEM, while the particle size distribution was measured by laser light-scattering particle size analyzer. In a typical experiment, 50 mg of PS particles as the sorbent was mixed on a magnetic stirrer with 50 ml of dye aqueous solution with the initial concentration of 5, 10 and 20 ppm, at room temperature. At time intervals of 5 to 120 minutes aliquots was withdrawn, centrifuged, and pollutant concentration was measured. The concentration of MB and BG in the solution before and after sorption by PS was calculated according to the absorbance value at 665 nm (for MB) and 624 nm (for BG) determined by UV measurements performed on a UV-Vis spectrophotometer in the wavelength range of 300–800 nm. Capacity of MB and BG sorption by prepared PS particles was found to be above 86 % after 120 minutes.