Watech-2013
International Exhibition and Conference on
Water Technologies, Environmental Technologies & Renewable Energy
February 13-14, 2013 Bombay Exhibition Centre, Mumbai, India

Banana peel as a potent, low-cost bio-adsorbent for water purification

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Abstract

Biosorbents provide a novel approach of purification of water for domestic or industrial use and may be preferred over conventional techniques due to their low cost, easy availability and ease of handling. The present study concerns the removal of toxic dyes such as Congo Red and Titan Yellow and toxic metal ions (common contaminants found in industrial waste water) using banana peel as a biosorbent. Three forms of banana peel- fresh peel, dried peel powder and a slug mounted in a column – were tested and their results were compared. Effects of varying the particle size of adsorbent and of pH on the adsorption of contamination were also investigated. This study has shown that the removal of contamination is a function of contact time, pH and particle size of adsorbent material. Maximum removal of Congo red (to the extent of 97%) has been achieved at pH 8 in 60 to 120 min at an initial concentration 50mg/L. It was found that Slug formation method showed better results as compared to the other methods. The removal of toxic elements and very significant reduction in electrical conductance of water samples point out to the possible application of banana peel as a potent, low-cost and innovative biosorbent for purification of water, contaminated due to industrial pollution or due to accumulation of ions in water drawn from bore wells in rural areas. . The adsorptive property of the biosorbent may be attributed to the functional groups like –OH and –COOH present in banana peel.

Biography

Ravindra RP is Professor in Pharmaceutics & Chairperson (PG) at NMIMS- School of Pharmacy & Technology Management; a premier educational institute in Pharmacy He has published more than 20 papers in reputed journals and has been keen on research in socially relevant areas.