

**Synthesis of Magnetic Carbonised Banana Peel as a Versatile and Reusable  
Adsorbent for Water Purification**  
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Discharge of industrial effluents containing dyes, metal ions and pesticides poses a serious threat to the environment. Examples include dye pollution in Asian countries like Bangladesh as well as the Flint water crisis in Michigan, USA. Banana peel is a widely available food waste that has potential to be used as a biosorbent. Carbonising banana peel enhances its adsorption capacity, while magnetising it renders the separation after adsorption simple and convenient via a magnet. Magnetic carbonised banana peel (MCB) was prepared by dispersing 3g to 5g of carbonised banana peel into aqueous iron salts. Results show that the percentage removal of brilliant green dye, lead(II) ions and atrazine by MCB was more than 95% and the maximum adsorption capacity of MCB derived from the Langmuir isotherm was comparable to commercial activated carbon for lead(II) ions but slightly lower than that of commercial activated carbon for brilliant green dye. The effectiveness of MCB in removing the two pollutants did not drop significantly and close to 100% of MCB could be retrieved using a magnet for 3 progressive cycles of adsorption and desorption, unlike commercial activated carbon. MCB shows great promise as a versatile, eco-friendly and reusable adsorbent for water purification.