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**Removal of hexachlorobenzene by zero valent iron impregnated on rambutan peel biochar**

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Water pollution associated with organo-chlorine pesticides poses serious threats to aquatic ecosystems. To address it, the novel Zero Valent Iron impregnated Biochar composites (ZVI-B<sub>r</sub>) were synthesized by simplistic approach using rambutan peel waste and applied for the removal of hexachlorobenzene (HCB) in aqueous solution. Field Emission Scanning Electron Microscopy (FESEM) and Energy Dispersive Spectroscopy (EDS) confirmed the successful dispersal of 20-100 nm sized iron nanoparticles on the surface of biochar. The variable parameters including pH, dosage of adsorbent, time were optimized for the best removal of OCPs. Batch experiments revealed that ZVI-B<sub>r</sub> combines the advantage of adsorption and de-chlorination of HCB in the spiked solution and 100% removal was obtained within 45 minutes at pH 4 at room temperature. Detection of intermediates and final de-chlorinated by products has confirmed the simultaneous adsorption and de-chlorination of HCB in water. Additionally, the isotherm and kinetic studies indicated that the adsorption isotherm data were fitted well to Langmuir isotherm and the experimental kinetic data were fitted well to pseudo first-order model. The pseudo first-order reduction rate constant ( $k_{\text{obs}} \text{ min}^{-1}$ ) was found to be  $0.0182 \text{ min}^{-1}$ . The experimental results herein demonstrate that the application of this as-prepared ZVI-B<sub>r</sub> could represent an effective functional material for adsorption and subsequent reduction in aquatic system is a promising environmental pollution monitoring for the HCB removal.

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