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Research Article

Reuse Potential of Carbon Nanotubes in Removing Cadmium from Water

Author(s): Abdullah Al-Mamun*, Ma'an Fahmi R. Al-Khatib, Rabiatul Adawiyah Bt Danial, Aliyu Salihu, Md. Zahangir Alam.

Affiliation: Bioenvironmental Engineering Research Centre (BERC), Faculty of Engineering, International Islamic University Malaysia (IIUM), 53100 Kuala Lumpur, Gombak, Malaysia

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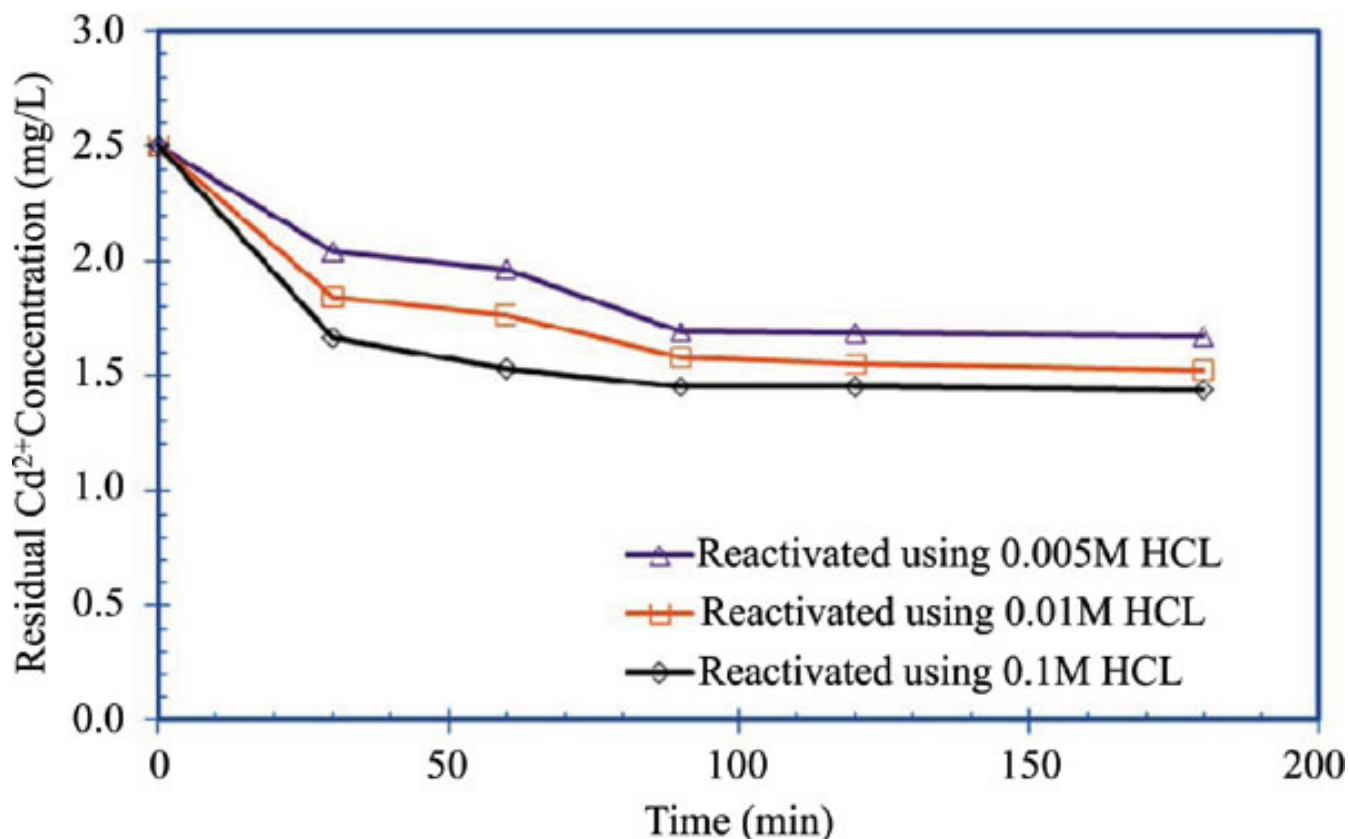
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Graphical Abstract:**Abstract:**

Introduction: This study was aimed at determining the optimum condition for desorption of cadmium loaded carbon nanotubes (cCNTs) for re-adsorption of the same metal ion.

Materials and Methods: Two independent parameters (contact time and HCl concentrations) were subjected to statistical optimization by face centered central composite design (FCCCD).

Result: Maximum desorption cCNT was achieved under the optimized conditions of pH 1.40 and 130 min contact time. The coefficient of determination (R^2) of the developed model was found to be 0.988, indicating the fitness of the experimental and predicted responses. Following the desorption experiments, the efficiency of re-adsorption of Cd²⁺ by the CNT was 61.08%.

Conclusion: The reduced re-adsorption capacity of CNT could be linked to modification of its sorption sites based on acid desorption process.

Keywords: Adsorption, cadmium, carbon nanotubes, desorption, optimization, reuse.

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