Research Article

Reuse Potential of Carbon Nanotubes in Removing Cadmium from Water

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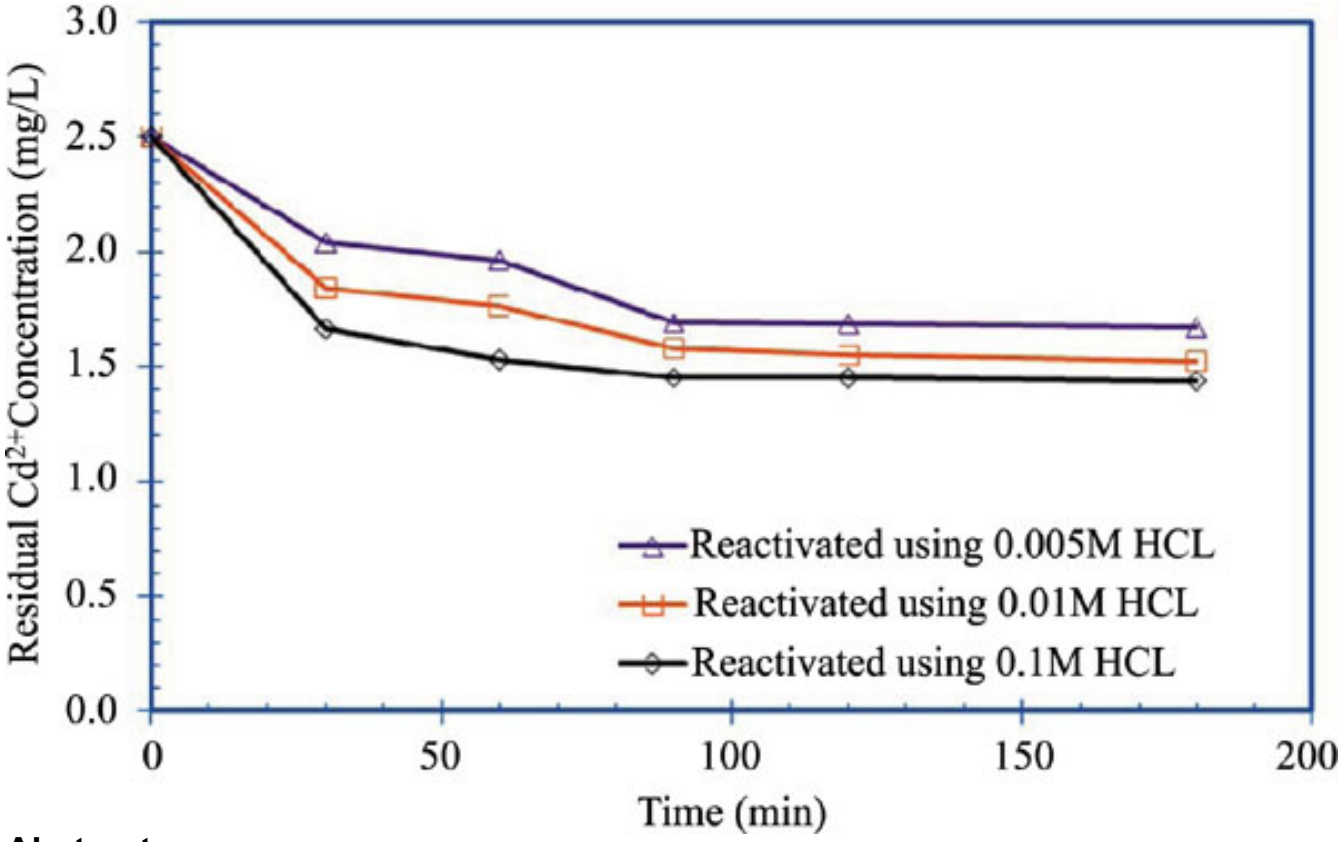
Graphical Abstract:



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 (R2) 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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