



## Fenton regeneration of humic acid-spent carbon nanotubes

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### ABSTRACT

Carbon nanotubes (CNTs) are known as efficient sorbents for removal of organic compounds from aquatic solutions. In the present study, the efficiency of Fenton solution for regeneration of CNTs exhausted with humic acid was studied. CNTs were produced using chemical vapor deposition method. The molar ratios of Fe<sup>2+</sup> to H<sub>2</sub>O<sub>2</sub> as 0.5:10, 1:10, and 2:10 were used. The saturation cycles were continued up to five stages. Results of Fenton regeneration showed higher regeneration efficiency (65.4%) for 2:10 M ratio comparing to other molar ratios after five cycles of regeneration. Slight decrease in adsorption capacity after each regeneration cycle was observed which may be due to the deposition of decomposed residues in CNT pores, which blocked the carbon porosity and decreased the specific surface area. In conclusion, the Fenton regeneration especially at higher Fe<sup>2+</sup>:H<sub>2</sub>O<sub>2</sub> molar ratios showed a possibility as an alternative to chemical and thermal regenerations of CNTs.

*Keywords:* Carbon nanotubes; Fenton; Regeneration; Humic acid; Hydrogen peroxide

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