



Comparison of zero valent iron and zinc oxide green nanoparticles loaded on activated carbon for efficient removal of Methylene blue

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Received 26 December 2017; Accepted 29 January 2019

ABSTRACT

In this study, iron nanoparticles (GnZVI) and zinc oxide nanoparticles (GnZnO) were synthesized by *Peganum harmala* seeds extract using green method, and were loaded on activated carbon derived from *P. harmala* seed (AC). TEM analysis showed that the nanoparticle size was smaller than 100 nm, while EDAX analysis confirmed that GnZVI and GnZnO were stabilized on AC. BET analysis showed that GnZnO/AC and GnZVI/AC special surface areas were 208 and 107 m²/g, respectively. Moreover, the FTIR analysis showed the role of polyphenolic groups in the synthesis of nanoparticles. It was generally found that GnZnO/AC showed higher efficiency in the adsorption of methylene blue as compared with GnZVI/AC.

Keywords: Activated carbon; Adsorption; Green synthesis; Methylene blue; nZVI

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