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Review study methods of removing pollutants from water by nanotechnology

Amir Gholami [1,*]

[1] Department of Mechanical Engineering, Dezful Branch, Islamic Azad University, Dezful, Iran

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Abstract

Healthy water, which is vital to humans' health, is defined as a water that is free from chemicals and pathogens. Healthy water can also be used as a necessary raw material in various key industries including electronics, pharmacology and food industries. Nowadays, the world faces a lot of challenges to respond to the ever-growing demand for healthy water as a fresh water resource. With the advent of new technologies, there are currently new techniques and achievements in different fields as well as wastewater and industrial wastewater treatment. Nanotechnology enjoys an especial place in understanding and controlling different organic pollutants. Recent treatment technologies have led to new techniques using nanotechnology and porous media which display high capacities in eliminating organic elements from water and wastewater. In this review study we focused on researches on nanomaterials including, removing organics from water using nanoparticles and active coal, transferring metal oxide nanoparticles in saturated porous medium, using zero valent iron nanoparticles to remove chrome from water, removing arsenic from water using zero valent iron on active carbon, effective bromate reduction in water using active carbon granules impregnated with iron nano-hydroxide, nitrate reduction using Fe/Cu nanoparticles, synthesis of porous nanocomposite natural charcoal-magnesium oxide in order to remove phosphate and nitrate from aqueous solution, development and characterization of micro-porous ceramic membrane, Ti_3SiC_2, to carry out microorganism filtration. The aim of this study was to review methods and chemicals that eliminate organics from liquids such as acids and other similar particles as well as presenting some nano materials applications in eliminating pollutants from water.

[*]**Corresponding author:** amirgholami4511@gmail.com

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