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**SS-017 . Water Decontamination Using Nanotechnology**

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Treatment processes for wastewater and drinking water have still the vital importance globally. Water-borne diseases have the great impact all around the world. Innovative water technologies with high efficiency are needed. Advance water technologies to reduce energy consumption are also required for developing countries. There are four major classes of pollutants for the drinking and ground water included physical, chemical, biological and radiological. Bacteria, viruses, parasites, pesticides, organic and inorganic chemicals are the major causes of water contamination. Nanoscale materials especially nanoparticles and nanocolloids started to play a significant role in health and environmental processes. Although nanoscale materials are less than 1,000 nm in size, they are usually defined as organic or inorganic materials with at least one dimension of less than 100 nm. Due to their large surface to volume ratio, these materials have unique surface properties which make them attractive in many areas. In addition, their surface is modifiable with different kind of materials such as polymers and metals. These coating materials which carry functional groups enable them to react with target molecules. Nanotubes, nanoparticles, catalytic membranes, nanopowder and granules are the nanoscale materials that used to decontaminate the water. Nanoscale zero valent iron was used to remove the arsenic and hexavalent chromium from drinking water and contaminated groundwater with the supporting material of activated carbon and carboxymethyl cellulose, respectively. Fe3O4 iron oxide nanoparticles were also used to remove the arsenic from the water. The size effect of these particles has been tested and compared each other. The results showed that 12 nm of nanoparticles in size were capable of achieving 99% removal of arsenic where the 300 nm of nanoparticles in size were only reached the 25% removal. Nanometallic silver nanoparticles were also used to remove the E.coli from the contaminated water.

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