

SOME ENVIRONMENTAL APPLICATIONS OF NANOTECHNOLOGY

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Nanotechnology is an emerging concept in the field of science and technology. The existing products are improved and also new products are created by using materials and structure with nanoscale dimension. One nanometer is one billionth of a metre, which corresponds to ultra-micro worlds such as the width of a semiconductor line, the size of a virus (10-100 nm), a protein molecule, a hydrogen atom or the diameter of a DNA double helix (1-10 nm). The exploration of this world requires the development of a totally different technology. For the technology to meet the high expectations associated with it will require a deliberate understanding not only of how nanoscale materials perform and why, but also the health, safety and environmental considerations they present [1].

Environmental applications of nanotechnology address the development of solutions to the existing environmental problems, preventive measures for future problems resulting from the interactions of energy and materials with the environment, and any possible risks that may be posed by nanotechnology itself [2].

This study gives knowledge on environmental remediation by nanotechnology. First, the essential aspects of environmental problems are reviewed and then the application of nanotechnology to the compounds, which can serve as environmental cleaning, is described. Various environmental treatments and remediations using different types of nanostructured materials from air, contaminated wastewater and soil are discussed. The categories of nanoparticles studied include those which are based on iron, catalytic particles, clays, carbon nanotube and magnetic nanoparticles [3]. Their advantages and limitations in the environmental applications are evaluated and compared with each other and with the existing techniques. The operating conditions such as required doses, pH, initial concentrations, and treatment performances are also presented and compared.

References

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3. *W.X. Zhang, and T. Masciangioli*, *Environ. Sci. Technol.* 37, 102A (2003).