TECHWATCH LANKA

"A vital link between global technology developers and the local technology practitioners".

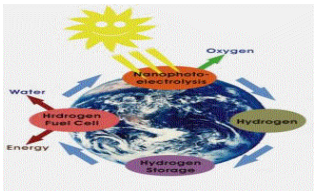
Newsletter of the Technology Watch Centre (TWC), National Science Foundation

VOL. 3 NO. 3 APRIL 2004 ISSN 1391-7897

Nanoecology - an effective tool in pollution control

Nanoecology is the molecular level engineering process of products and machines to create cleaner environment. Since the industrial revolution, manufacturing has been creating unavoidable, wasteful by-products. These by-products are usually harmful to life yet, too expensive to disarm. So they are spewed into the air, dumped in the rivers and seas, or buried underground. Concerted efforts made by the environmental scientist and technologists laid the background work to control this global phenomenon through implementing nano-scale work to clean up tainted water and soil.

First and foremost elimination of garbage through acquiring the benefit of nano-scale materials was considered. The idea is to use solid wastes like tyres, charcoal dust and coffee wastes to manufacture activated carbon which could be in turn used in waste water treatment plants. Establishing the activated carbon manufacturing plants would be a prime solution to manage the solid waste problem and to remove pollutants from waste water bodies. Scientists have identified nanotechnology as a successful tool in manufacturing activated carbon containing tiny pores, which facilitate the adsorption of bigger molecules of pollutants like dioxins, methane, ethane, and benzene gases or colour pigments from garment factories.



According to the published evidences creation of miniature sensors, pollutant filters and fuel cell catalysts to overcome environmental ill effects could be benefited by nanotechnology. Miniature sensors developed through nanotechnology could also be used to detect specific pollutants accidentally or deliberately released into the environment. The removal of pollutants may be achieved through filters incorporating nano-particles, the first of which may be available within a couple of years. Nanotechnology might also be used in catalysts that promote key chemical reactions within fuel cells that might be used with sources of renewable energy.

Nano-scale iron powder is turning out to be a remarkably effective tool for cleaning up contaminated soil and ground-water landfills, abandoned mines, and industrial sites. Brick red iron oxide formed during rusting, possesses the ability to trap the organic contaminants such as trichloroethene, carbon tetrachloride, dioxins, or polychloronated biphenyls (PCBs) and breaking them down .

Proponents to this approach point out filter systems for drinking or waste water, natural gas pipelines, and smokestacks that can be designed at the molecular level, to remove even the most minuscule of impurities. For water, filteration means cleaner drinking. For gas, finer filtration means cleaner burning, with fewer smog-creating impurities. Industrial plants may be able to use more sensitive emission "scrubbers" that screen even nano-sized fleck of soot from waste gases.

Thus the entire concept of nanoecology would undoubtfully fill the vaccum to cater the pollution control with less consumption of human energy.

Inside this issue of "TECHWATCH LANKA".....

Biotechnology.....2
Organic food contaminated with GM

Aquaculture Technology.....4
Aquaponics

Food Science & Technology.....6
Extruded breakfast cereal systems

Textile Technology.....8
Enzymatic removal of starch in fabrics

Management of Technology.....10
The digital economy

Electronics & Telecommunication Technology.....12
Network supersaver

Information Technology.....14
Intel makes light work for chips

Civil, Mechanical & Manufacturing Technology.....16
Smart windows for buildings and cars

Rubber & Polymer Technology.....18
Enviromentally friendly plastic foams

Environmental Science & Technology.....20
Microbial enzyme solves industrial waste problem