

Chemistry

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Gold and Silver for Water Purification

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The News:

The precious metals of gold and silver got a more precious role to play - in the field of water purification. Two scientists from the Indian Institute of Technology, Madras, T. Pradeep and A. Sreekumaran Nair, have patented technology to use gold and silver nano-particles to filter dreaded pesticides like endosulfan, malathion and chlorpyrifos from wa-ter.

What did they do?

The process makes use of the nano-technology. Nano particles are very small in size, in the order of millionth fraction of a millimeter, to be precise. The technology relies on the ability of the nano-particles of gold and silver to bind with the residual pesticide molecules from flowing water through adsorption (not absorption! Adsorption is condensation /formation of a layer of liquid or gas on the surface of a solid (grain)).

Eureka Forbes, which makes the Aquaguard range of multi-step water purifiers in India, have acquired a license to use this new technology. It is all set to roll out products featuring this tech-nology soon, says P.J. Reddy, Director of Aquamall Water Solutions Lim-ited, a subsidiary of Eureka Forbes. Initially they may make use of this technology in their high-end products, reported The Hindu.

Amidst the raging controversy over, profit happy Cola Multi-national corporations allegedly implementing different quality commitments in India as against the American, European and other advanced countries, such a technology is most welcome in India. Before Colas, the same Centre for Science and Environment (CSE) also exposed the double standrds of these Cola majors and other bottled water manufacturers on the pesticide content well above prescribed levels.

Though, Indian government have, controversially gave a clean chit, no one believed them. The track record of the government and these cola firms in India is all too well known. In such a scenario, the scientists naturally hope that the technology would address the growing concern over access to safe drinking water. Obviously, it is useful for other countries as well.

Dr. Pradeep and his IIT colleague Birgit R. Burgi, co-authored a paper titled "Societal implications of nano0s-cience and nano -technology in de-veloping countries." This article published in the Cur-rent Science journal, notes that "Water purification systems equipped with nano-materials and using new kinds of membrane technologies with variable pore

sizes as filters could provide people in any area with safe drinking water," reports The Hindu.

How it works?

During 2003 and 2004, Dr. Pradeep and his team of scientists at IIT, Madras have discovered that gold parti-cles of diameter 10 to 20 nano-metres and silver particles of diameter 60 to 80 nano-metres had the tendency to adsorb pesticides, effectively filtering the flowing water of these impu-rties. The nano-parti-cle solutions changed colour inn the presence of re-sidual pesticides in water.

However, the regulations of Bureau of Indian Standards (BIS) stipulates acceptable level of residual pesticide as 0.5 ppb (parts per billion) but the scientists could not measure with that much precision for lack of precise instrumentation.

Current Scenario:

So, is it end of the euphoria? No, certainly not! The Aqua Diagnostic Labs of Eureka Forbes near Bangalore is internationally-certified and the tests conducted there on gas chromatography equipment with electron capture detector actually showed that the nano-par-ticles adsorbed the pesticide molecules. The presence of residual pesticides also found to be below the prescribed levels.

The good scientists, while suggesting to better use the technology on a large scale purification system like a community treatment plant, than in home water purifiers, have offered even to waive the royalty, if any village panchayat (local self governing body of a village) approaches for a communi-ty water purifier.

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