MATERIALS SCIENCE

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Unfolded Fullerene Quantum Dots for the detection of heavy metals in water

Roberto Pizzoferrato
Departement of Electronics Engineering, University of Rome “Tor Vergata”, Rome (Italy)

Contamination of water with heavy metals such as lead, arsenic, copper and cadmium, has long been known as dangerous for environment and very harmful for human health. To the end of revealing and monitoring the diffuse presence of these toxic species, development of new portable, cheap, fast and easy-to-use sensors is desirable. We have, therefore, investigated a new quantum dot material, obtained from chemical cage-opening of fullerene C_{60}, for use as fluorescence sensor. These Unfolded Fullerene Quantum Dots (UFQDs) showed optical absorption and blue fluorescence which depended on the presence in water of Cu^{2+}, Pb^{2+}, Cd^{2+} and As(III) in a different way for each distinct ion. This property makes it possible to discriminate between the different species in view of the implementation of an optical selective multiple sensor .