

Clean water using advanced materials: Science, incubation and industry

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Access to clean water is one of the most important indicators of development. This water has to be affordable to make a meaningful impact to the society. We have been studying the chemistry of nanomaterials with the objective of developing affordable solutions for clean water. Creation of affordable materials for constant release of silver ions in water is one of the most promising ways to provide microbially safe drinking water for all. Combining the capacity of diverse nanocomposites to scavenge toxic species such as arsenic, lead, and other contaminants along with the above capability can result in affordable, all-inclusive drinking water purifiers that can function without electricity. The critical problem in achieving this is the synthesis of stable materials that can release or adsorb ions continuously in the presence of complex species usually present in drinking water that deposit and cause scaling on nanomaterial surfaces. We have shown that such constant release/adsorbing materials can be synthesized in a simple and effective fashion in water itself without the use of electrical power. The nanocomposite exhibits river sand-like properties, such as higher shear strength in loose and wet forms. These materials have been used to develop an affordable water purifier to deliver clean drinking water at Rs. 130/y per family. The ability to prepare nanostructured compositions at near ambient temperature has wide relevance for adsorption-based water purification. We have implemented such solutions already in arsenic affected areas of India. In the next 12 months, we are expected to provide arsenic free water to 1000,000 people. Translation of this science led to the incubation of a company which has its own manufacturing unit now. A healthy mixture of basic science, applications and business in the Indian context is manifested here.

References

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