

Fluoride Removal Technologies and R&D Efforts in India

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Abstract

India is one of the countries in the world where fluoride contamination in drinking water has assumed alarming situation. Recent studies have indicated that twenty Indian states have certain degree of groundwater fluoride contamination, impacting 85-97% of districts in some states. A number of research institutes are actively engaged to develop indigenous cost effective technologies. In seventies Nalgonda Technique was developed in India and was practised in many fluoride affected areas of not only India but other countries too. Various technologies based on adsorption, ion exchange and membranes have also been developed in India and are at various stages of commercialization or field testing. The recent trends are to synthesize low cost materials which could be effectively utilized for defluoridation. The present review highlights the more recent efforts being put into research and development for mitigation of fluoride from aqueous solutions. Investigations carried out by numerous researchers in India for defluoridation of drinking water on adsorbents based on alumina, clay, chitosan, carbon, iron oxides and rare earth oxides are briefly discussed. Studies based development of modified membranes and ion exchange resins are also included.