

Remediating fluoride and boron contaminants from water using envelope of carbon particles and nano fibrous filters.

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Background: Extreme fluoride concentrations have been reported in ground waters of more than 20 developed and developing countries including India, South America and Europe, out of which alone in India, 19 states are facing acute fluorosis problems. Various technologies are being used to remove fluoride from water but still, the problem has not been rooted out. Problems of similar sort are stated for Boron too, though not in the same geographical coordinates. The boron contamination is quite an issue for European context. Hence the issue can be applied for remediation irrespective of geographical coordinates. The main problem with an assessment of fluoride contaminants is that they are not needed to be decontaminated fully if done so then it has some adverse health issues are apprehended. So measuring the concentration of fluoride and boron contaminants in water a filtration system is showcased discovered, which is economically viable and can be implemented in both large scale and small scale modules. The main objective of this paper is to showcase the decontamination of fluoride and boron from the water using carbon particles and nanofibrous filter.

Results: In this work, different concentration of carbon nanoparticles were used for decontamination of fluoride and boron contaminants using column separation method and hence its kinetics and stability were measured and fit to be an efficient system of filtration. Since the experimental set up was navigated at different contact times the efficiency of the whole filtration system was found to be 93 % in case of boron contamination and 87% in case of fluoride contamination. Finally, different envelope pouch of filters was tested at different concentration levels to cross check the efficiency of the filtration system.

Conclusion: This major system of filtration is quite cost effective and easy to fit use mechanism using Nanofibrous filters and carbon particles. This filtration system has important applications in terms of groundwater remediation, wastewater treatment even at industrial scale.

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