Control of aluminium in treated water after defluoridation by electrocoagulation and modelling of adsorption isotherms

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ABSTRACT

The removal of fluoride from drinking water by use of aluminium compounds is more prevalent than other defluoridation techniques due to the strong affinity between aluminium and fluoride. Electrocoagulation (EC) with aluminium electrodes is one such technique which is successfully used for defluoridation of water. But various monomeric and polymeric hydroxyl species of aluminium and fluoride complexes are formed in the process. In the recent past, the adverse effects of aluminium have been recognized. The present study was carried out to control aluminium content in water after defluoridation by EC process. In the present study, the aluminium content after EC was in the range of 6.2–48.5 mg/L, which was brought down to range 11.25–14.99 mg/L through optimized energy usage and further brought down to 0.030–0.149 mg/L with use of bentonite as coagulant.

Keywords: Defluoridation; Aluminium control; Coagulation; Optimization and adsorption isotherm