

## The Efficiency of Iron and Manganese Removal from Groundwater Using Tower Aeration

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Groundwaters passing through different layers of soil and due to its water properties and its high solubility, contain elements and minerals of material in the soil that sometimes can be dangerous for the health of consumers or at least undesirable in terms of cognitive beautiful. Iron and manganese are from constitutive of the soil and rocks of the Earth's surface. Water penetration through soil and rock can minerals such as these elements have dissolved and bring them into solution. The problems of iron and manganese in groundwater in domestic installations, commercial, industrial and refineries are created, and because much of the community water supply from underground water supplies will be removed where iron and manganese concentrations exceeded it is necessary. In this study Tower aeration system performance for the removal of iron and manganese from groundwater sources have been studied. In this research, pilot column aeration tower design, implementation and was established. This system made of PVC with a diameter and height 150 cm and 15 cm which was filled with flexible pipe parts. The initial pH=5, 7 and 9 and the initial concentration of Fe and Mn 2, 3 and 4 mg/l of the output system, sampling was done. Sample uptake rate for iron and manganese than the wavelength 510 nm and 525 nm by Varian spectrophotometer model UV-120-02 was measured. The result showed that the highest and the lowest rate of iron removal by tower aeration system was obtained pH=9, initial concentration of iron 2 mg/l (85%) and pH=5,

initial concentration of iron 4 mg/l (46%) respectively. Also the highest and the lowest rate of manganese removal by tower aeration system was obtained pH=9, initial concentration of manganese 2 mg/l (82%) and pH=5, initial concentration of manganese 4 mg/l (40%) respectively. In general, we can conclude that with increasing pH, packed tower aeration system performance in the elimination iron and manganese at all of initial concentrations of iron and manganese input has increased. The main reason it, the increased amount OH in water and increase the formation of Sedimentation of ferric hydroxide and manganese dioxide. Mahvi et al. showed that the two methods stepped aeration and dropped, with increasing concentrations of iron and manganese input and initial pH, the elimination these two elements has increased [1, 2]. The increased elimination of iron and manganese with increase concentration of these elements in the input perhaps because air supply required for the oxidation ferro iron to ferric and manganese two capacity to four capacity by methods stepped aeration and dropped. Pacini et al. showed that the rate of iron elimination from water by ash with increase pH, has increased. Then have also shown that the amount of iron and manganese elimination from water by biological coarse filtration technology with increase pH, has increased [3]. The data from this study is consistent.

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