

## **Investigation on the Manganese Phase Diagram when Manganese is Reacting with Calcium Hypochlorite**

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Oxidation Reduction behavior of different substances highly contributes to the condition of water and phase diagram express the relationship between Eh and pH of a particular substance. When Manganese is in water, it can exist either as suspension matter or as dissolved matter and exact speciation can be determined by investigating the Manganese phase diagram. The objectives of this study were to investigate a suitable method to reduce excess Manganese from water by flocculation and filtration process and identify the different species of Manganese from phase diagram which can be removed from water as insoluble form. Excess concentration of Manganese was reduced by oxidizing to an insoluble form using Calcium hypochlorite and resulting insoluble form was removed by flocculation and filtration. Behavior of the Manganese species fluctuates with different pH and Eh values. The pH values of the samples were measured directly by pH meter and Eh values were determined by both calculated value from Nernst equation and measured value as oxidation reduction potential. After 30 minutes of time residual Chlorine values of all the trials were zero. Manganese rich water was synthetically prepared by adding MnSO<sub>4</sub> in to raw water sample collected from Maguru Oya, Wariyapola. Manganese was removed as a brown color deposition which was confirmed as Mn<sub>3</sub>O<sub>4</sub> (Hausmannite) by Manganese phase diagram. This deposition can be removed by using suitable filtration process and removal efficiencies were 33%, 22%, 11% and 0 with concentration of Calcium hypochlorite of 0.6 ppm, 0.7 ppm, 0.8 ppm and 0.9 ppm respectively. That need to be confirmed by further studies because raw water sample may have different cations and anions.

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