

**Method Number: TM 005**

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**Method Summary****Determination of Manganese II using Hach Lange test kit****Scope and Range**

This method is to determine Manganese II in aqueous samples using the Hach Lange test kit.  
This is an unaccredited method

Detection Limit:- Waters: 0.2 mg/l

Working Range:- 0.2 - 5.0 mg/l using 10 mm cuvette.

**References**

Hach Lange LCW032

Reference DOC312.53.94386

**Principle**

Manganese (II) ions react with Formaldoxime in an Ammoniacial solution to form a red-coloured complex. The quantification of the divalent ion is performed via absorption measurement at 455nm using a Spectrophotometer.

Samples filtered using 0.45µm filter to remove any solids. The samples must have a pH between pH 3 -10 and pH altered to bring into range, if required.

Manganese can exist in various oxidation/valence states; the most common are +2, +3, +4, +6 and +7.

The most stable state is +2 (Manganese II)

Oxidation states +3, +5, +6 and +7 tend to be oxidizing agents and are vulnerable to disproportionation. In naturally occurring water systems and sewages it is likely that these states would undergo disproportionation to form Manganese II and Manganese IV

As such, where the sample is a naturally occurring water or sewage, it is possible to calculate the concentration of Manganese IV by subtracting the analysed concentration of Manganese II from the analysed concentration of Total dissolved Manganese in a sample,

**Interferences**

Calcium and magnesium concentrations above 300 mg/l cause high-bias results. Concentrations of phosphate ions above 5 mg/l cause low-bias results only if calcium ions are also present; otherwise, they do not interfere.

After the coloured complex has been formed any turbidities must be removed by filtration before solution is measured photometrically.