

Manganese in Water

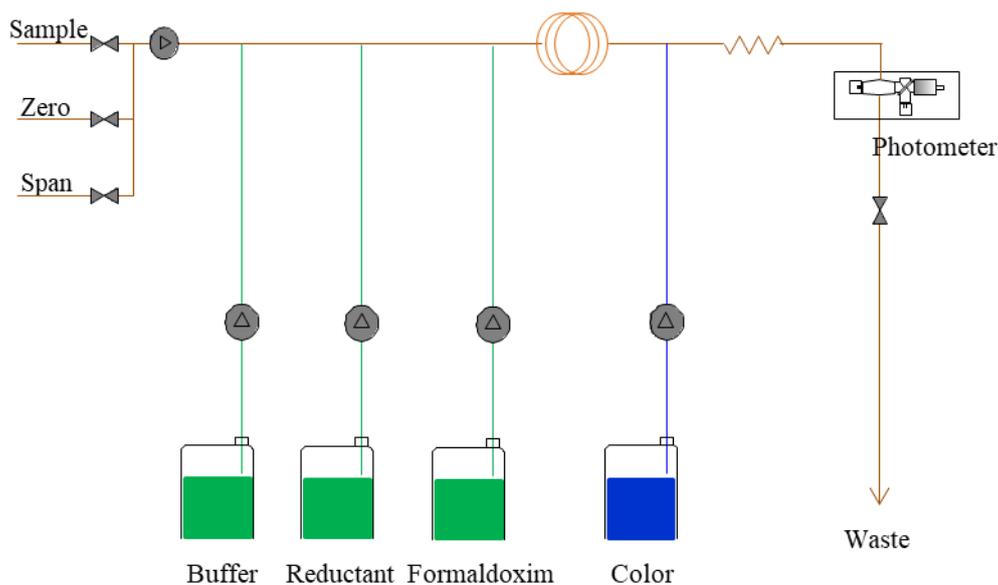
Description

Alkaline Mn(II)-solutions react with formaldoxime to an orange-red complex $(CH_2NO)_3Mn$ with manganese in the third valence. Atmospheric oxygen oxidises Mn(II) to Mn(III) during the complex formation. Absorption peaks are at 450 nm.

Formaldoxime is not for sale. It is produced by combination of formaldehyde and hydroxylamine hydrochloride. An addition of EDTA at the end of the reaction destructs a possible formed iron complex.

The buffer reagent tends to outgassing at higher ambient temperatures. Therefore in the reagent line a de-aeration vessel is placed. This has to be checked frequently and de-aerated if necessary. The method is linear up to 2 mg/L. At 3 mg/L the deviation is -2.5%, at it is 4 mg/L -5%..

Operation:	Cyclic
Dilution:	None
Inteferences:	Cu (1,00; 0,004), Ni (1,00; 0,165), Fe (1,00; -0,008) As well as U, V and metals that form precipitations or turbidity in alkaline environment like Bi, Hg, Ti



Typical performance data using aqueous standards(in percent of range)

Measurement accuracy	3% or 0.002mg/L what ever is greater
Repeatability(Coefficient Variation 50%)	0.54%
Detection limit(lowest range)	0.004mg/L
Calibration time;	26 min
Measurement time;	13 min

BL Process

Hardware Specification

Measuring system:	Photometer
Flowcell path length:	20mm (0-0.2 ... 0-2.0mg/L)
Measured wavelength	480nm LED/ 450nm IF
Number of pumps	3

Reagent Consumption (13min cycle)

Reduction solution	~17L
Buffer(Ammonia lye)	~17L
Formaldehyde	~17L
Mask solution	~11.8L

System Maintenance

Weekly	Check function of valves and pumps Check calibration parameters Check tubing cleanliness
3-monthly	Change pump tubes Check and clean flowcell
Yearly	pump rotors and replace if necessary Replace all tubing

Data Sheets and Reagents

Mn(mg/L)	Datasheet	Required reagent.
0-0.02...0-2.00	20mm	Reduction solution, Ammonia lye, Formaldehyde. Mask solution.

References