

# Manganese

## Method

Surface and ground waters rarely contain more than 1 mg/L of soluble or suspended manganese. Manganese can act as an oxidizing or a reducing agent depending on its valence state. Manganese is also used in the manufacture of batteries and as an alloying metal in the manufacture of steel and aluminum. The National Secondary Drinking Water Standard for manganese is 0.05 mg/L, as higher concentrations will impart a foul taste to water and discolor laundry and porcelain surfaces.

### The Periodate Method

Reference: APHA Standard Methods, 14<sup>th</sup> ed. Method 314 C (1975).

CHEMetrics' tests employ the periodate chemistry that measures soluble manganese compounds but does not differentiate the various valence states. Results are expressed as ppm (mg/L) Mn.

Permanganate ( $MnO_4^-$ ) develops approximately 25% more color with this reagent than other forms of manganese, causing a high bias. If the sample is known to contain manganese in the form of permanganate only, multiplying test results by 0.8 will improve the accuracy of the results.

## Visual Kits

**Range: 0-2 ppm**  
MDL: 0.15 ppm / Method: Periodate

	Cat#
<b>CHEMets Kit</b>	<b>K-6502</b>
CHEMets Refill, 30 ampoules	R-6502
Activator Solution Pack, six 10 mL bottles	A-6502 <sup>1</sup>
Comparator, Shelf life 1 year: 0, 0.3, 0.6, 0.8, 1.0, 1.5, 1.8, 2.0 ppm	C-6502
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, Activator Solution, 25 mL sample cup and instructions.	

**Range: 0-60 ppm**  
MDL: 9 ppm / Method: Periodate

	Cat#
<b>VACUettes Kit</b>	<b>K-6502D</b>
VACUettes Refill, 30 ampoules	R-6502D
Activator Solution Pack, six 10 mL bottles	A-6502 <sup>1</sup>
Comparator, Shelf life 1 year: 0, 9, 18, 24, 30, 45, 54, 60 ppm	C-6502D
Kit comes in a plastic case and contains everything needed to perform 30 tests (except distilled water): Refill, Comparator, Activator Solution, dilutor snapper cup, sample cup top, micro test tube and instructions.	

## Instrumental Kit

### Multi-Analyte Photometers V-2000 / V-3000

(See page 14 for instrumental features)

**Range: 0-30.0 ppm**  
Method: Periodate

	Cat#
<b>Vacu-vials Kit</b>	<b>K-6503</b>

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Activator Solution, 25 mL sample cup, 1.0 mL syringe, ampoule blank and instructions.

*Vacu-vials Kits require the use of a CHEMetrics Direct-Readout Photometer (photometers sold separately) or a spectrophotometer capable of accepting a 13 mm diameter round cell. See page 14 for details.*

### Components and Accessories

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Sample Cup Top Pack for 25 mL Cup (6 ea)	A-0014
Micro Test Tube Pack (10 ea)	A-0015
Dilutor Snapper Cup Pack (6 ea)	A-0018
Ampoule Blank Pack (5 ea)	A-0023
Syringe Pack, 1.0 mL (6 ea)	A-0027
* Sample Zeroing Accessory Pack	A-0503

<sup>1</sup> The accessory pack supplies enough solution to perform at least 200 tests.

\* For use when testing colored or turbid samples. See page 13 for details.

Instructions and SDSs are posted on our website.

If no shelf life is listed for a product, then the shelf life is at least 1 year.

