



Manganese Test

MERCK

1.10080.0001

Mn

1. Method

In the reaction zone of the analytical test strip, manganese(II) ions are oxidized to manganese(IV) oxide, which transforms an organic redox indicator into a coloured oxidation product. The concentration of manganese(II) is measured **semiquantitatively** by visual comparison of the colour of the reaction zone with the fields of a colour scale.

2. Measuring range and number of determinations

Measuring range/colour scale graduation ¹⁾	Number of determinations
2-5-20-50-100 mg/l Mn ²⁺	100

¹⁾ for measurement of concentrations >100 mg/l Mn²⁺ see section 6

3. Applications

Sample material:

Groundwater and drinking water
Industrial water and wastewater
Quality control (e.g. in the tanning and textile industry)

4. Influence of foreign substances

The test is also sensitive to oxidizing cations and anions (see section 7, "Notes").

The influence of foreign substances was checked – in the case of interfering ions up to concentrations of 1,000 mg/l – in solutions containing 50 mg/l Mn²⁺.

The concentrations given in the table lie below the limit at which the determination is interfered with.

Concentrations of foreign substances in mg/l			
Acetate	1,000	CrO ₄ ²⁻	10
Ag ⁺	25	Cu ²⁺	100
Al ³⁺	1,000	F ⁻	1,000
Ascorbate	1,000	Fe ²⁺	25
Bj ³⁺	1,000	Fe ³⁺	10
Br ⁻	1,000	Hg ²⁺	1,000
Ca ²⁺	1,000	K ⁺	1,000
Cd ²⁺	1,000	Mg ²⁺	1,000
Cl ⁻	1,000	Na ⁺	1,000
CN ⁻	1,000	NH ₄ ⁺	1,000
Co ²⁺	50	Ni ²⁺	1,000
Cr ³⁺	0.05	NO ₂ ⁻	10
		NO ₃ ⁻	1,000
		Oxalate	1,000
		Pb ²⁺	1,000
		PO ₄ ²⁻	1,000
		S ²⁻	10
		SCN ⁻	1,000
		Sn ²⁺	25
		SO ₃ ²⁻	100
		SO ₄ ²⁻	1,000
		S ₂ O ₃ ²⁻	1,000
		Tartrate	1,000
		Zn ²⁺	1,000

5. Reagents and auxiliaries

Please note the warnings on the packaging materials!

The analytical test strips are stable up to the date stated on the pack when stored in the closed tube at +15 to +25°C.

Package contents:

Tube containing 100 analytical test strips
1 bottle of reagent 1 ("Reagenz 1")
1 bottle of reagent 2 ("Reagenz 2")

Other reagents:

Universal indicator strips pH 0–14,
Cat. No. 1.09535.0001
Sulfuric acid 25 % GR, Cat. No. 1.00716.
Manganese standard solution, 1,000 mg/l Mn²⁺,
Cat. No. 1.19789.0500

6. Preparation

● Samples containing more than 100 mg/l Mn²⁺ must be diluted with distilled water.

● The pH must be within the range 1–7. Check with universal indicator strips. Adjust, if necessary, with sulfuric acid.

7. Procedure

● Remove 1 analytical test strip and **immediately reclose the tube.**

● Immerse the reaction zone of the test strip in the solution to be tested **for 1 sec** and then shake off excess liquid from the strip.

● Place 1 drop of reagent 1 on the reaction zone and allow to react **for 15 sec.** Subsequently shake the test strip **well** to remove excess liquid.

● **After 15 sec** place 1 drop of reagent 2 on the reaction zone, allow to react **for 60 sec,** and then shake off excess liquid from the test strip.

● Compare the colour of the reaction zone with the colour fields on the label. Determine with which field the colour of the reaction zone coincides most exactly and read off the corresponding concentration value in mg/l Mn²⁺. If an exact colour match cannot be achieved, estimate an intermediate value.

Notes:

● In samples containing oxidizing cations or anions, the reaction zone turns green in colour **even before** the addition of the reagents.

● If the colour of the reaction zone is equal to or more intense than the colour field for 100 mg/l Mn²⁺, the manganese concentration may actually be considerably higher. For this reason, in such cases the measurement should be repeated using **fresh**, gradually diluted samples until a value less than 100 mg/l Mn²⁺ is obtained.

8. Method control

To check analytical test strips, reagents and procedure:
Dilute manganese standard solution to 50 mg/l Mn²⁺ and analyze as described in section 7.

9. Note

Stopper reagent bottles immediately after use.