

APPLICATION NOTE

T2O-AN-256

MANGANESE METHOD

The following application note explains the procedure for the detection of Manganese using the HM2000 Metalometer.

PLEASE READ THIS APPLICATION NOTE CAREFULLY. TRACE2O® HAS ALTERED THE NAMES OF SOME REAGENTS FOR SIMPLICITY AND SO THE PROCEDURE MAY BE DIFFERENT FROM THAT FOLLOWED PREVIOUSLY.

Equipment:

- **HM2000 Kit**
- **Mn vial**
- **HT46 Vario Manganese Citrate Buffer F10 PP sachet** (Previously M56a sachet)
- **HT47 Vario Sodium periodate F10 PP sachet** (Previously M56b sachet)
- **MN400 Mn Standard** (Previously M56 standard)
- **Pipette**

Safety:

- Consult the safety data sheet for all of the reagents before use. Even if you have used Metalometer reagents before, the formulation may have changed.
- **HT47 Vario Sodium periodate F10 PP sachets** are oxidising – keep away from heat, and avoid mixing with combustibles.

Getting started:

- Switch the unit on using the power key.



- Select the Manganese method by depressing the [MODE] key until 'Mn' is displayed.



Blank analysis:

- Ensure that the **Mn vial** is clean.
- Fill the **Mn vial** with 10ml of the water sample.
- Close the vial tightly with the cap
- Place the **Mn vial** in the sample chamber, making sure that the marks on the instrument and vial are aligned.
- Press the [ZERO/TEST] key



- The method symbol flashes for approx. 8 seconds.
- The display shows: 0.0.0

Sample preparation:

- Add **one HT46 Vario Manganese Citrate Buffer F10 PP sachet** straight from the foil to the water sample.
- Close the vial tightly with the cap and swirl several times to mix the contents.
- Add **one HT47 Vario Sodium periodate F10 PP sachet** straight from the foil to the water sample.
- Close the vial tightly with the cap and invert several times to mix the contents.

Analysis:

- Place the **Mn vial** in the sample chamber, making sure that the marks on the instrument and vial are aligned.
- Press the [!] key and hold.



- Press and release the [ZERO/TEST] key.



- Release the [!] key.
- The display shows: 02:00 and begins counting down.
- **Wait for a reaction period of 2 minutes.**
- After the reaction period is finished the measurement starts automatically.
- The method symbol flashes for approx. 3 seconds.
- The result is shown in the display in mg/l Manganese.

Preparation of check standard

- Attach a clean pipette tip to the end of the pipette and set the pipette to 250µL.
- Add 250µL of the **MN400 Mn Standard** to the clean **Mn vial**, and then add deionised water to the 10ml line.
- Continue with blank analysis, and sample preparation and analysis as above from step 3 of 'Blank analysis'.
- The result displayed should be 1.0 mg/l Manganese ± 0.1 mg/l.
- If the result obtained deviates by more than the above limits, thoroughly rinse both vials and the sample beaker with deionised water, clean the vials and sample beaker with an IPA wipe, rinse again with deionised water, and repeat the measurement with a fresh check standard sample.
- If the result still deviates by more than the above limits, contact Trace2o for further assistance.

LOD/Tolerance

- The Lower LOD is 0.1 mg/l (100ppb), upper LOD is 18 mg/l (18000ppb).
- Tolerance: 0.1 – 10 mg/l ± 0.1 mg/l Mn.
> 10 mg/l ± 0.5 mg/l Mn.

Notes

- For best results, thoroughly clean the vials and the measuring beaker between tests with IPA wipes. Rinse thoroughly with deionised water. Ensure that the outside of the vials are clean, dry and free from fingerprints. Always handle the vials by the lid where possible.
- This method is applicable for the determination of soluble Manganese in water and wastewater.
- Highly buffered water samples or extreme pH values may exceed the buffering capacity of the reagents and requires sample pre-treatment.
- If samples were acidified for storing, adjust the pH to between pH 4 and pH 5 before testing. Do not exceed pH 5, as Manganese may precipitate.
- Known interferences: Calcium, Chloride, Iron, Magnesium.
- Solutions are available for combating some interferences in the sample. These may be specific to particular water types or conditions. For further information, please contact Trace2o Technical Support department – technical@trace2o.com