HM2000

APPLICATION NOTE T2O-AN-206

MANGANESE METHOD

The following application note explains the procedure for the detection of Manganese using the HM2000 Metalyser®.
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**
- **HM4 Buffer** (Previously M6 Buffer A solution)
- **HM5 Buffer** (Previously M6 Buffer B solution)
- **MN40 Mn Standard** (Previously M6 Standard (4ppm))
- **HG100 Thick Hg Plating Solution** (Previously M6 Conditioning Solution)

Electrode conditioning:

- Polish WE1 Electrode to a mirror finish and perform a visual check to ensure that no scratches or scuffs are present.
- Half-fill the sample analysis beaker (SAB) with **HG100 Thick Hg Plating Solution** and fit to the Sonde.
- Select 'M6 Conditioning' from the 'Test Methods' menu then select 'Condition Electrode'.
- The M6 conditioning step will take approximately 10 minutes.
- Once completed, return the **HG100 Thick Hg Plating Solution** to the **HG100 Thick Hg Plating Solution** bottle and rinse the Sonde and SAB with the Electrode Rinse Solution and/or deionised water.

Sample preparation:

- Using a plastic syringe, add **14ml HM4 Buffer** to the SAB.
- Add 56ml of sample water to the SAB
- Using the pipette, add **280µl HM5 Buffer** to the SAB.

There are two methods for carrying out the analysis. The single-point standard addition is the recommended option, using two data points to calculate concentration. The calibration option is designed for rapid analysis of several samples with a similar matrix (i.e. several samples from different points along the same river bank).

Analysis (single-point standard addition method)

- Fit the SAB to the Sonde (If not using submersion method).
- Select 'Mn' from the 'Test Methods' menu, then select 'Condition Electrode' and wait approximately two minutes for it to complete.
- Select 'Standard Addition'. Wait approximately two minutes until prompted to add 20ppb of the standard. When prompted use the pipette to add 280µL of the **MN40 Mn Standard** into the SAB and click 'OK'. The analysis will continue to run for approximately two further minutes after which the results will be displayed.

Result (single-point standard addition method)

- The result(s) are shown in the instrument display until 'Ok' is clicked. Following this the user will be given the option of saving the ppb results into the results log. The most recent scan can be viewed graphically in 'Data log', 'Last result'. The graph displayed is that of the scan after the standard addition, and is intended for diagnostic purposes only. If Mn has been detected the peaks will be identified as Mn and will be marked up as such. The original sample concentration will be reported in ppb.

Analysis (calibration method)

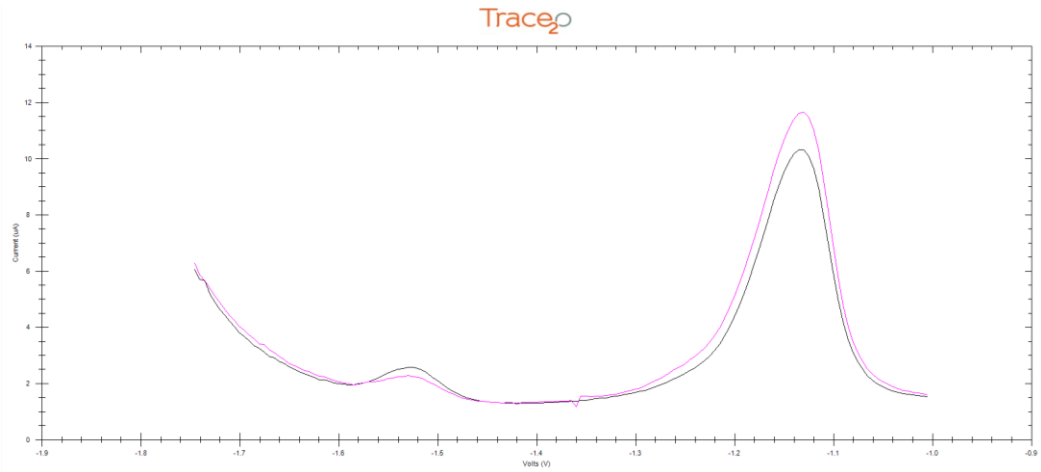
- Fit the SAB to the Sonde.
- Select 'Mn' from the 'Test Methods' menu, then select 'Condition Electrode' and wait approximately two minutes for it to complete.
- Select 'Calibration'. Wait approximately two minutes until prompted to add 20ppb of the standard. When prompted use the pipette to add 280µL of the standard into the SAB and click 'OK'. The analysis will continue to run for approximately two further minutes until prompted to add another 20ppb of standard. Repeat the addition process and click 'ok'. The analysis will run for another two minutes before completing the calibration.
- Once the calibration has been completed several consecutive analyses can be carried out.
- Select 'Analyse Sample' and wait approximately two minutes for the analysis to complete.

Result (calibration method)

- The result(s) are shown in the instrument display until 'Ok' is clicked. Following this the user will be given the option of saving the ppb results into the results log. The most recent scan can be viewed graphically in 'Data log', 'Last result'. The graph displayed is intended for diagnostic purposes only. If Mn has been detected the peaks will be identified as Mn and will be marked up as such. The original sample concentration will be reported in ppb.

Graph

- Manganese appears as a broad peak at around -1.55V. Zinc will appear to the right, at around -1.15V. Disregard the Zinc peak, as this is merely required for co-deposition and does not affect the outcome of the result.



LOD

- The Lower LOD is 5ppb, upper LOD is 200ppb.
- To increase the range the sample can be diluted using Ultra-pure de-ionised water. Other water types could introduce contamination.

Interferences

- Extremely acidic sample water may affect the quality of the analysis.
- Solutions are available for combating 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