HM2000

APPLICATION NOTE T2O-AN-252

BORON METHOD

The following application note explains the procedure for the detection of Boron 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**
- **B vial**
- **Stirring rod**
- **HT11 Boron No. 1 Tablet** (Previously M52a tablet)
- **HT12 Boron No. 2 Tablet** (Previously M52b tablet)
- **B400 B Standard** (Previously M52 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.

Getting started:

- Switch the unit on using the power key.

- Select the Boron method by depressing the [MODE] key until ‘Bor’ is displayed.

Blank analysis:

- Ensure that the **B vial** is clean.
- Fill the **B vial** with 10ml of the water sample.
- Close the vial tightly with the cap.
- Place the **B 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 HT11 Boron No. 1 Tablet** straight from the foil to the water sample.
- Crush the tablet using a clean stirring rod, until the tablet is dissolved.
- Add **one HT12 Boron No. 2 Tablet** straight from the foil to the same water sample.
- Crush the tablet using a clean stirring rod.
- Close the vial tightly with the cap and swirl several times until the tablets are dissolved.

Analysis:

- Place the **B 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: 20:00 and begins counting down.
- **Wait for a reaction period of 20 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 Boron.

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 **B400 B Standard** to the clean **B 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 Boron ± 0.1 mg/l.
- If the result obtained deviates by more than the above limits, thoroughly rinse the vial with deionised water, clean the vial 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 2 mg/l (2000ppb).
- Tolerance: ± 0.05 mg/l B.

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.
- The tablets must be added in the correct sequence.
- The sample solution should have a pH value of between 6 and 7.
- Interferences are prevented by the presence of EDTA in the tablets.
- The rate of colour development depends on the temperature. The temperature of the sample must be 20°C ± 1°C.