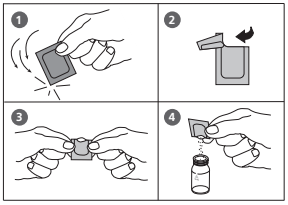
# 2 4 2 Manganese LR with Vario Powder Pack

0.01 – 0.7 mg/l Mn


Use two clean vials (24 mm Ø) and mark one as blank for zeroing (Note 1).

1. Fill a clean vial with **10 ml of deionised water** (this is the blank).
2. Fill the second clean vial with **10 ml of the water sample** (this is the sample).



3. Add the contents of **one Vario Ascorbic Acid Powder Pack** straight from the foil into each vial (Note 2).
4. Close the vials tightly with the caps and swirl several times to mix the contents.
5. Fill each vial with drops of the same size by holding the bottle vertically and squeeze slowly (Note 3):
   **15 drops of Alkaline Cyanide reagent solution**
6. Close the vials tightly with the caps and swirl several times to mix the contents.
7. Fill each vial with drops of the same size by holding the bottle vertically and squeeze slowly:
   **21 drops of PAN Indicator solution**
8. Close the vials tightly with the caps and swirl several times to mix the contents.

**Countdown 1**
**2:00**
**start: ↵**

9. Press **[↵]** key.
   Wait for a **reaction period of 2 minutes** (Note 4).

   After the reaction period is finished proceed as follows:
10. Place the vial (the blank) in the sample chamber making sure that the marks are ⧖ aligned.

**prepare Zero**
**press ZERO**

11. Press **ZERO** key.
12. Remove the vial from the sample chamber.
13. Place the vial (the sample) in the sample chamber making sure that the marks are ⧖ aligned.

**Zero accepted**
**prepare Test**
**press TEST**

14. Press **TEST** key.

    The result is shown in the display in mg/l Manganese.

**Notes:**

1. Rinse all glassware with 1:1 Nitric acid solution first and then rinse with deionised water.
2. Water samples that contain more than 300 mg/l $CaCO_3$ hardness: after adding the Vario Ascorbic Acid powder pack add additionally 10 drops of Rochelle Salt Solution.
3. After addition of the reagent solution "Alkaline-Cyanide" a cloudy or turbid solution may form in some water samples. The turbidity should disappear after point 7.
4. Water samples containing more than 5 mg/l iron should be allowed to react for at least 10 minutes.
5. Conversion:
   mg/l $MnO_4$ = mg/l Mn x 2.17
6. ▲ Mn
   $MnO_4$
   ▼ $KMnO_4$

| Reagent | Form of reagent/Quantity | Order-No. |
|---|---|---|
| **Set**<br>VARIO Ascorbic Acid<br>VARIO Alkaline-Cyanide<br>VARIO PAN Indicator | <br>Powder Pack / 100<br>Liquid reagent / 60 ml<br>Liquid reagent / 60 ml | 535090 |
| VARIO Rochelle Salzlösung | 30 ml | 530640 |