



Iron in Mo PP (224)

M224

0.01 - 1.8 mg/L Fe

FEM

TPTZ

## Instrument specific information

The test can be performed on the following devices. In addition, the required cuvette and the absorption range of the photometer are indicated.

Instrument Type	Cuvette	$\lambda$	Measuring Range
MD 100, MD 110, MD 600, MD 610, MD 640, MultiDirect, XD 7000, XD 7500	ø 24 mm	580 nm	0.01 - 1.8 mg/L Fe

## Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Fe in MO Reagent Set	1 Set	536010

## Application List

- Cooling Water
- Boiler Water

## Sampling

1. Samples are to be collected in clean glass or plastic bottles. These should have been cleaned with 6 N (1:1) Hydrochloric acid and then rinsed with deionised water.
2. To preserve samples for later analysis, the pH value of the sample must be adjusted to less than 2. Approximately 2 ml per litre of concentrated Hydrochloric acid can be added to the sample. the sample is tested immediately, this addition is not necessary.
3. If determination of dissolved Iron is required, the sample must be filtered through a 0.45-micron filter or equivalent medium immediately after it has been collected and before acidification.
4. Preserved samples should be stored no longer than 6 months at room temperature.
5. The pH is to be adjusted to 3–5 by adding 5 N Sodium hydroxide solution before the analysis. A pH value of 5 must not be exceeded, since this can lead to precipitation of iron.
6. The test result needs to be corrected on the basis of the volume additions.



## Preparation

1. All glassware is to be cleaned with cleaning detergents and then rinsed with tap water. Afterwards, it should be reclaimed with Hydrochloric acid (1:1) and deionised water. These steps will remove any deposits that may cause slightly higher results.
2. If the sample contains 100 mg/L or more Molybdate ( $\text{MoO}_4^{2-}$ ) then the sample reading must be taken immediately after zeroing the device.
3. For more accurate results, a reagent blank value can be determined for each new batch of reagent. Follow the procedure set out, using deionised water instead of the sample. The measured value that is obtained should be /subtracted from the readings of these results.

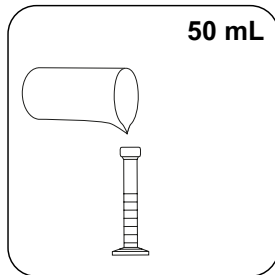
## Notes

1. A blue colour develops in the presence of iron. A small amount of undissolved powder has no influence on the result.

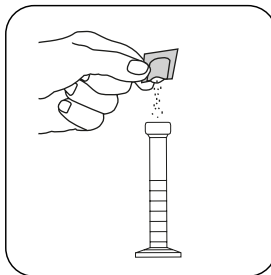


## Determination of Iron, total (Fe, Mo) in the presence of molybdate with Vario Powder Packs

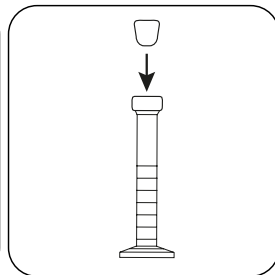
Select the method on the device.



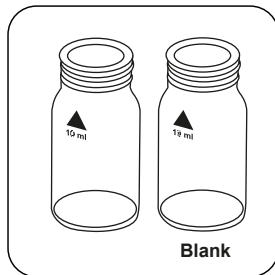
Put **50 mL sample** in 50 mL measuring cylinder.



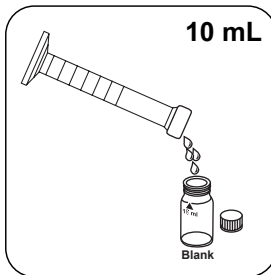
Add **Vario (Fe in Mo) Rgt 1 powder pack**.



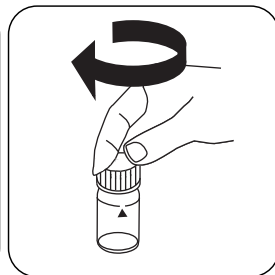
Stopper the mixing cylinder. Swirl around to dissolve the powder.



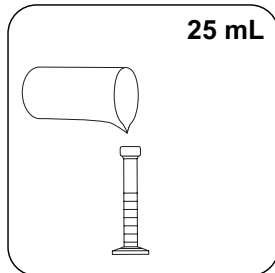
Prepare two clean 24 mm vials. Mark one as a blank.



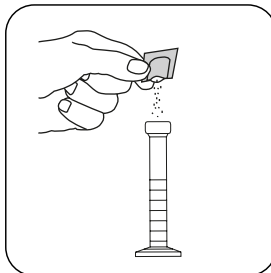
Fill blank with **10 mL prepared sample**.



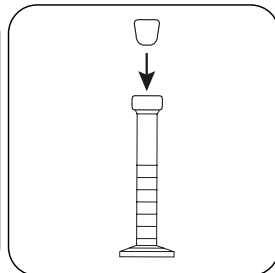
Close vial(s).



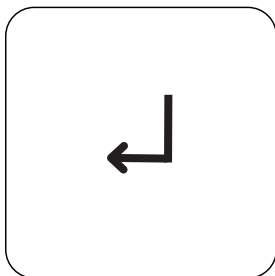
Put **25 mL prepared sample** in 25 mL measuring cylinder.



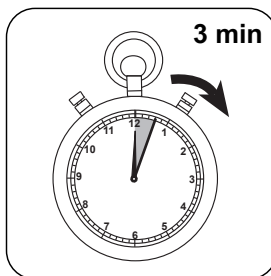
Add **Vario (Fe in Mo) Rgt 2 powder pack**.



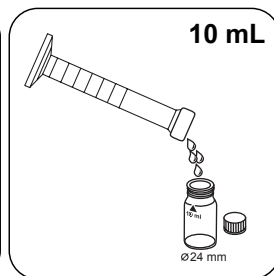
Stopper the mixing cylinder. Swirl around to dissolve the powder.



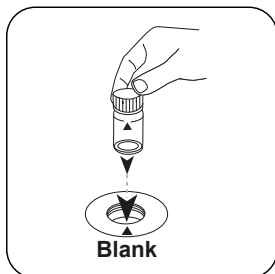
Press the **ENTER** button.



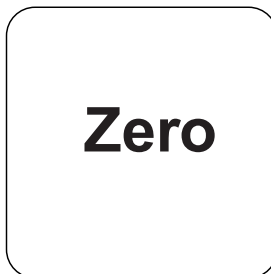
Wait for **3 minute(s) reaction time**.



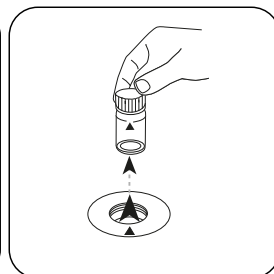
Put **10 mL sample** in the sample vial.



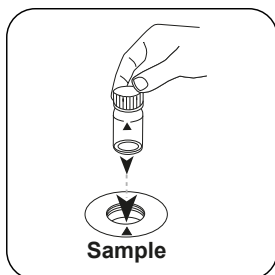
Place **blank** in the sample chamber. Pay attention to the positioning.



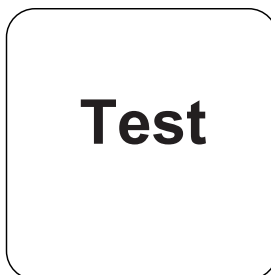
Press the **ZERO** button.



Remove the vial from the sample chamber.



Place **sample vial** in the sample chamber. Pay attention to the positioning.



Press the **TEST (XD: START)** button.

The result in mg/L Fe appears on the display.



## Chemical Method

TPTZ

## Appendix

### Calibration function for 3rd-party photometers

$$\text{Conc.} = a + b \cdot \text{Abs} + c \cdot \text{Abs}^2 + d \cdot \text{Abs}^3 + e \cdot \text{Abs}^4 + f \cdot \text{Abs}^5$$

	∅ 24 mm	□ 10 mm
a	$-3.53705 \cdot 10^{-2}$	$-3.53705 \cdot 10^{-2}$
b	$1.45425 \cdot 10^{+0}$	$3.12664 \cdot 10^{+0}$
c		
d		
e		
f		

## Interferences

### Removeable Interferences

- PH interference: A sample pH after the addition of reagent, which is less than 3 or greater than 4, may inhibit colour formation since the developed colour fades too quickly, or can result in turbidity. This means that the pH value must be adjusted to between 3 and 5 in the measuring glass before the addition of the reagent:  
A suitable amount of iron-free acid or base, such as 1 N Sulphuric acid or 1 N Sodium hydroxide, can be added on a drop by drop basis.  
A volume correction must be carried out if significant volumes of acid or base are added.

### Bibliography

G. Frederic Smith Chemical Co., The Iron Reagents, 3rd ed. (1980)