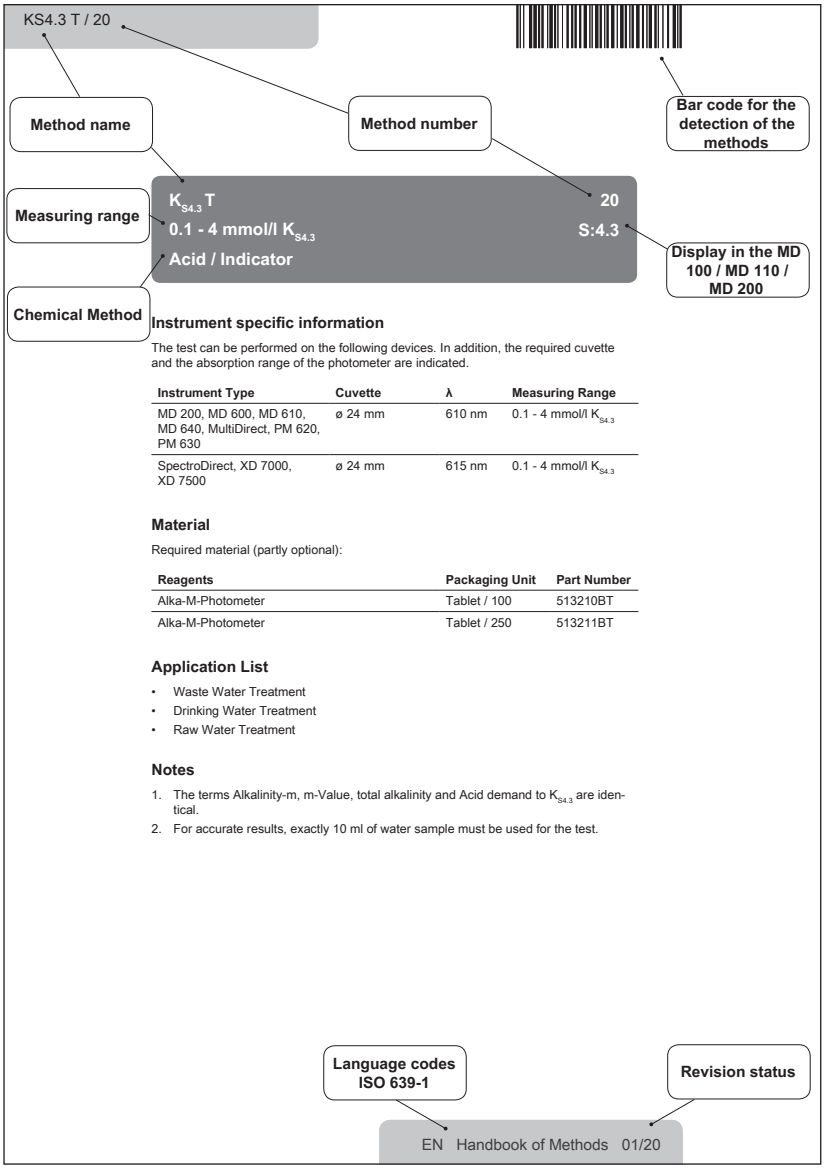
Lovibond® Water Testing

Tintometer® Group

Manual of Methods

MD 100 • MD 110 • MD 200

Manganese



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	λ	Measuring Range
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Alka-M-Photometer	Tablet / 100	513210BT
Alka-M-Photometer	Tablet / 250	513211BT

Application List

- Waste Water Treatment
- Drinking Water Treatment
- Raw Water Treatment

Notes

1. The terms Alkalinity-m, m-Value, total alkalinity and Acid demand to $K_{S4.3}$ are identical.
2. For accurate results, exactly 10 ml of water sample must be used for the test.

Performing test procedure

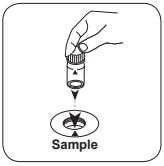
Implementation of the provision Acid capacity $K_{S4.3}$ with Tablet

Select the method on the device

For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500

Fill 24 mm vial with **10 ml sample**.

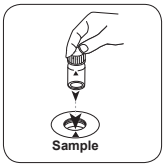
Close vial(s).



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

• • •

Dissolve tablet(s) by inverting.



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

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

The result in Acid Capacity $K_{S4.3}$ appears on the display.

Manganese T **M240**

0.2 - 4 mg/L Mn **Mn**

Formaldoxime

EN

Material

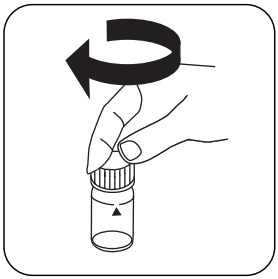
Required material (partly optional):

Reagents	Packaging Unit	Part Number
Manganese LR 1	Tablet / 100	516080BT
Manganese LR 1	Tablet / 250	516081BT
Manganese LR 2	Tablet / 100	516090BT
Manganese LR 2	Tablet / 250	516091BT
Set Manganese LR 1/LR 2 100 Pc.#	100 each	517621BT
Set Manganese LR 1/LR 2 250 Pc.#	250 each	517622BT

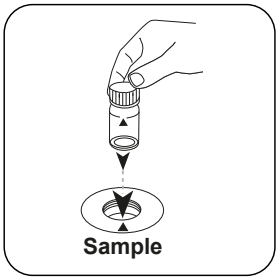
Determination of Manganese with Tablet

Select the method on the device.

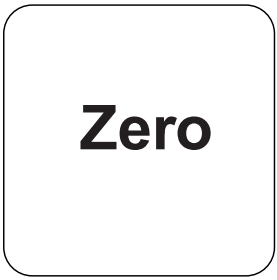
Fill 24 mm vial with **10 mL sample**.



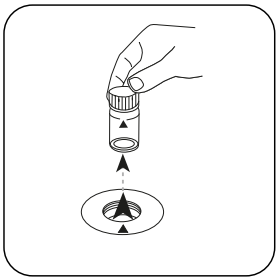
Close vial(s).



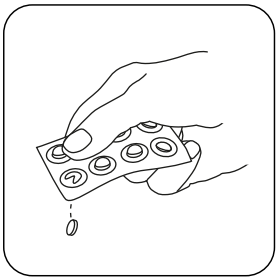
Place **sample vial** in the sample chamber. Pay attention to the positioning.



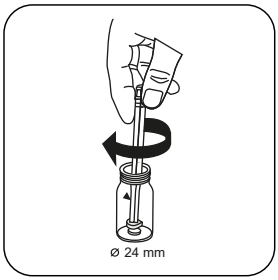
Press the **ZERO** button.



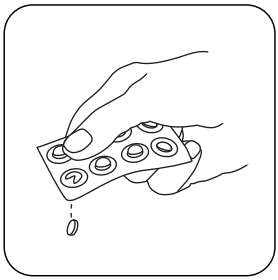
Remove the vial from the sample chamber.



Add **MANGANESE LR 1 tablet** .

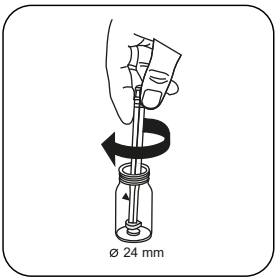


Crush tablet(s) by rotating slightly and dissolve.

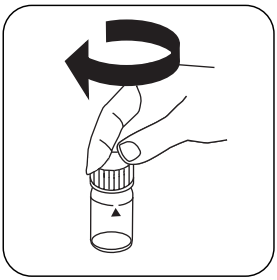


Add **MANGANESE LR 2 tablet** .

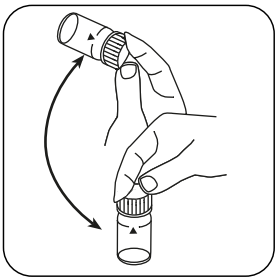
EN



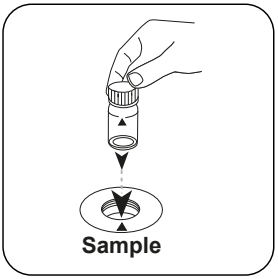
Crush tablet(s) by rotating slightly.



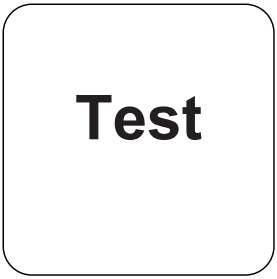
Close vial(s).



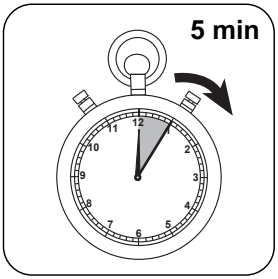
Dissolve tablet(s) by inverting.



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



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



Wait for **5 minute(s) reaction time**.

Once the reaction period is finished, the measurement takes place automatically.

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

Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemical Method

Formaldoxime

Appendix

Bibliography

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

According to

DIN 38406-E2

including stirring rod, 10 cm

Manganese LR PP M242

0.01 - 0.7 mg/L Mn Mn1

PAN

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Manganese Reagent, Set Low Range F10	1 pc.	535090
Vario Rochelle Salt Solution, 30 ml [h)]	30 mL	530640

Preparation

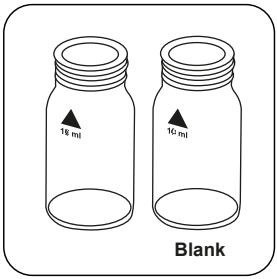
1. All lab glassware must first be rinsed with diluted nitric acid and then rinsed with deionised water.
2. Strongly buffered water samples or extreme pH values may exceed the buffering capacity of the reagents and pH values to be adjusted.
   If samples were acidified for storing, the pH value must be adjusted between 4 and 5 with 5 mol/l (5 N) Sodium hydroxide before the test. A pH value of 5 must not be exceeded, since this can lead to precipitation of manganese.

Notes

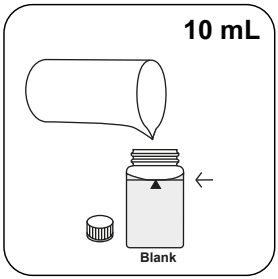
1. If water samples contain more than 300 mg/L $CaCO_3$ hardness, then after adding the Vario Ascorbic Acid powder pack, add an additional 10 drops of Rochelle Salt Solution.
2. After addition of the reagent solution “Alkaline-Cyanide” a cloudy or turbid solution may form in some water samples. Adding the PAN indicator solution should resolve the turbidity.
3. If the sample contains large amounts of iron (from 5 mg/L) a reaction period of 10 minutes must be adhered to.

Determination of Manganese LR with Vario Powder Packs

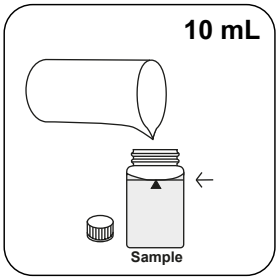
Select the method on the device.



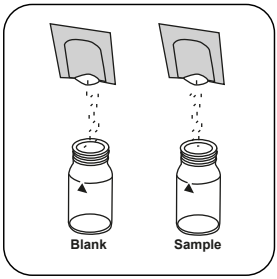
Prepare two clean 24 mm vials. Mark one as a blank.



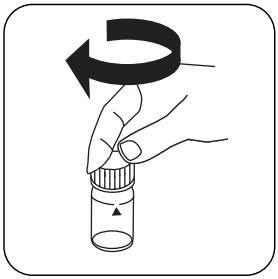
Put **10 mL deionised water** in the blank.



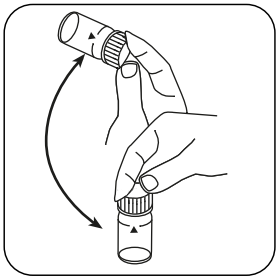
Put **10 mL sample** in the sample vial.



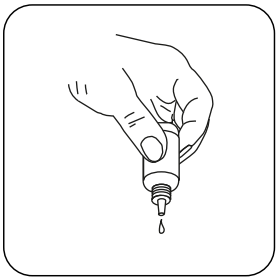
Add **a Vario Ascorbic Acid powder pack** in each vial.



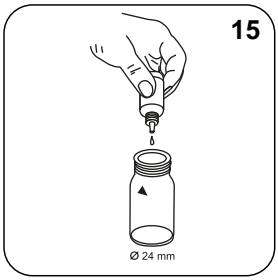
Close vial(s).



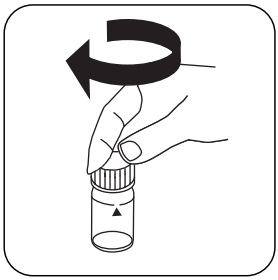
Invert several times to mix the contents.



Hold cuvettes vertically and add equal drops by pressing slowly.

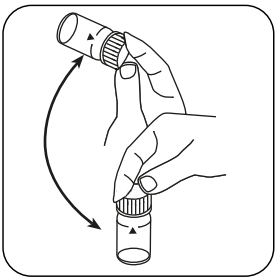


Add **15 drops Alkaline-Cyanide Reagenz**.

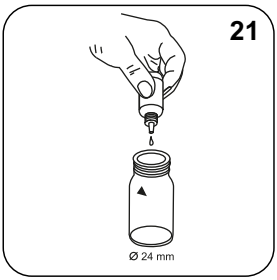


Close vial(s).

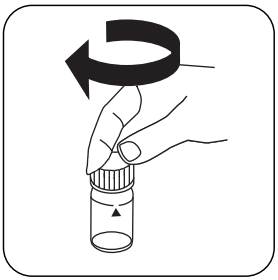
EN



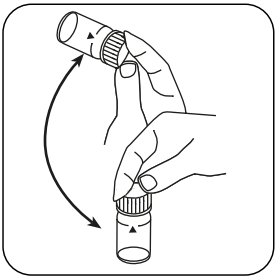
Invert several times to mix the contents.



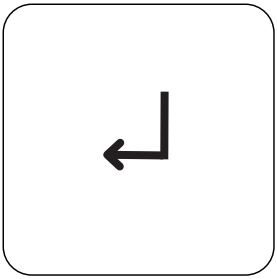
Add **21 drops PAN Indikator**.



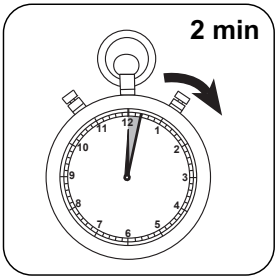
Close vial(s).



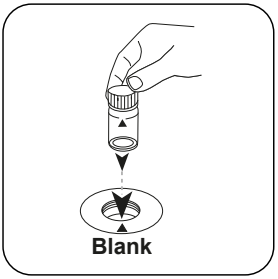
Invert several times to mix the contents.



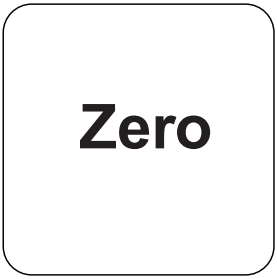
Press the **ENTER** button.



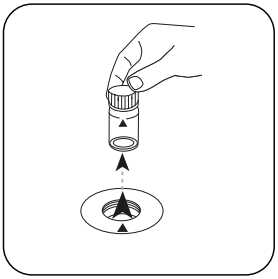
Wait for **2 minute(s) reaction time**.



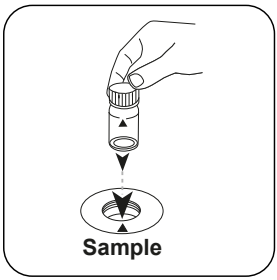
Place **blank** in the sample chamber. Pay attention to the positioning.

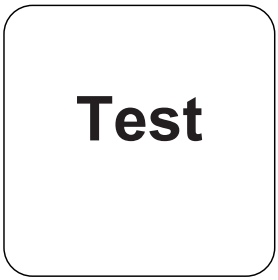


Press the **ZERO** button.



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 Manganese appears on the display.

Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemical Method

PAN

Appendix

Bibliography

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$

Manganese HR PP M243

0.1 - 18 mg/L Mn Mn2

Periodate Oxidation

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Manganese HR, Set High Range F10	1 Set	535100

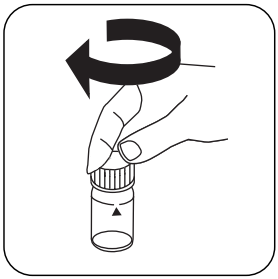
Preparation

1. Strongly buffered water samples or extreme pH values may exceed the buffering capacity of the reagents and pH values to be adjusted.
   If samples were acidified for storing, the pH value must be adjusted between 4 and 5 with 5 mol/l (5 N) Sodium hydroxide before the test. A pH value of 5 must not be exceeded, since this can lead to precipitation of manganese.

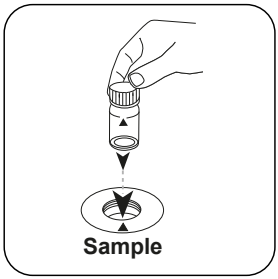
Determination of Manganese HR with Vario Powder Packs

Select the method on the device.

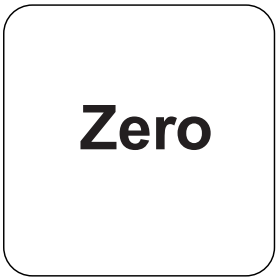
Fill 24 mm vial with **10 mL sample**.



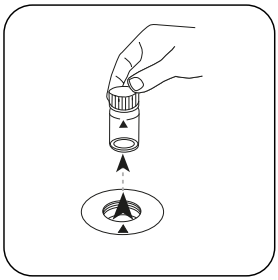
Close vial(s).



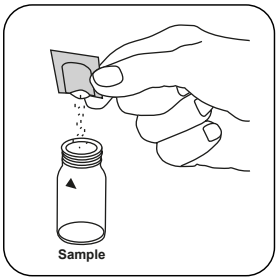
Place **sample vial** in the sample chamber. Pay attention to the positioning.



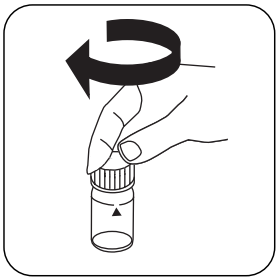
Press the **ZERO** button.



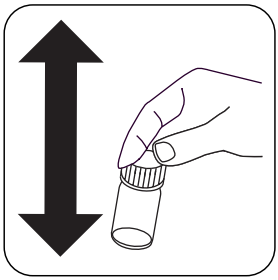
Remove the vial from the sample chamber.



Add **Vario Manganese Citrate Buffer F10 powder pack**.



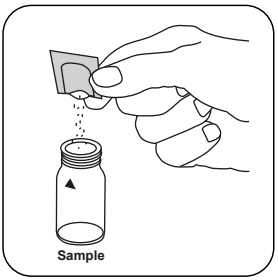
Close vial(s).



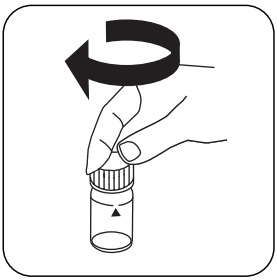
Mix the contents by shaking.

EN

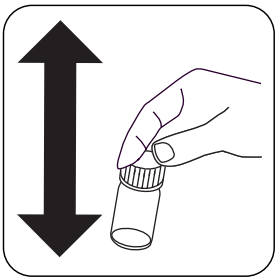
EN



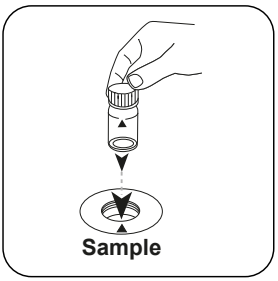
Add **Vario Sodium Periodate F10 powder pack**.



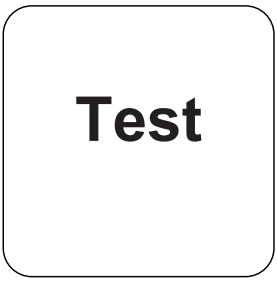
Close vial(s).



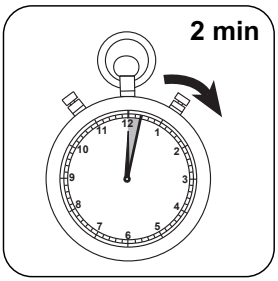
Mix the contents by shaking.



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



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



Wait for **2 minute(s) reaction time**.

Once the reaction period is finished, the measurement takes place automatically.

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

Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemical Method

Periodate Oxidation

Appendix

Interferences

Interference	from / [mg/L]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

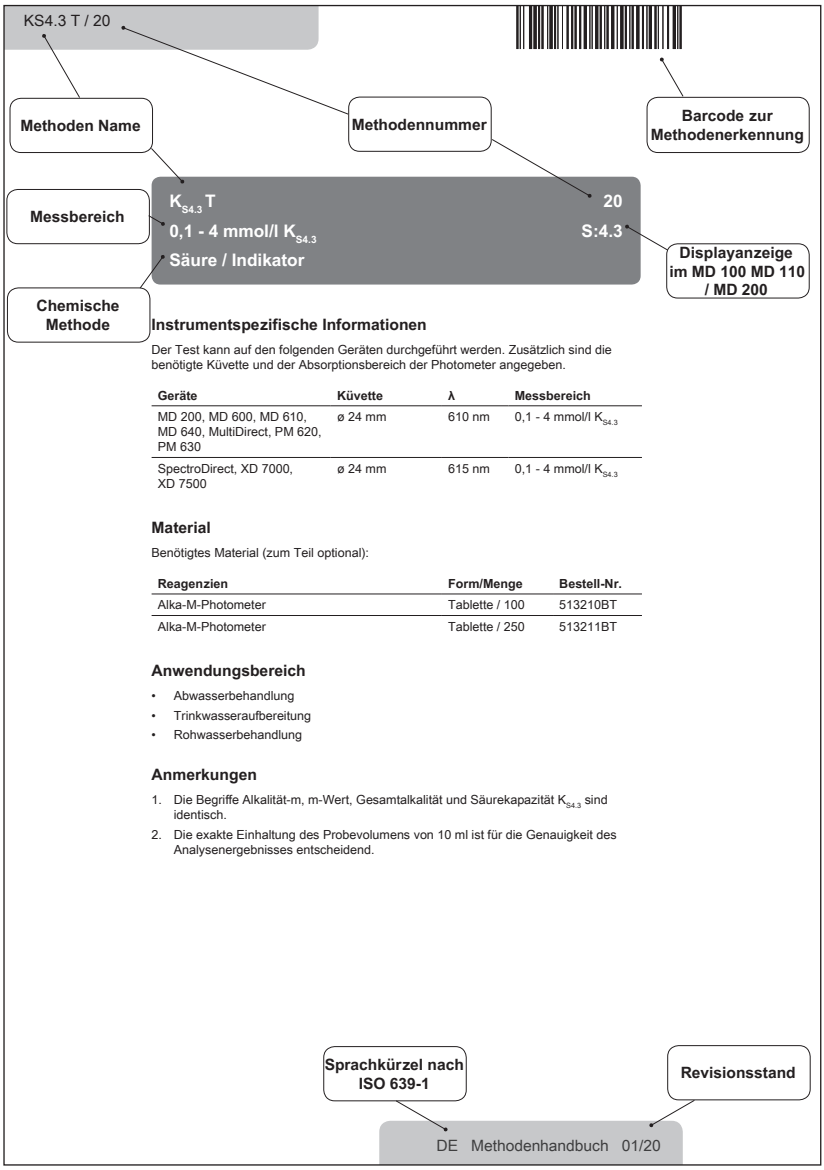
Method Validation

Limit of Detection	0.16 mg/L
Limit of Quantification	0.49 mg/L
End of Measuring Range	18 mg/L
Sensitivity	13.02 mg/L / Abs
Confidence Intervall	0.28 mg/L
Standard Deviation	0.12 mg/L
Variation Coefficient	1.29 %

According to

40 CFR 136 (US EPA approved HACH)

DE


KS4.3 T / 20
Methoden Name
Methodennummer
Barcode zur Methodenerkennung
Messbereich
$K_{S4.3}$ T
20
0,1 - 4 mmol/l $K_{S4.3}$
S:4.3
Säure / Indikator
Displayanzeige im MD 100 MD 110 / MD 200
Chemische Methode
Instrumentspezifische Informationen
Der Test kann auf den folgenden Geräten durchgeführt werden. Zusätzlich sind die benötigte Küvette und der Absorptionsbereich der Photometer angegeben.
Geräte | Küvette | λ | Messbereich
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630 | ø 24 mm | 610 nm | 0,1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500 | ø 24 mm | 615 nm | 0,1 - 4 mmol/l $K_{S4.3}$
Material
Benötigtes Material (zum Teil optional):
Reagenzien | Form/Menge | Bestell-Nr.
Alka-M-Photometer | Tablette / 100 | 513210BT
Alka-M-Photometer | Tablette / 250 | 513211BT
Anwendungsbereich
• Abwasserbehandlung
• Trinkwasseraufbereitung
• Rohwasserbehandlung
Anmerkungen
1. Die Begriffe Alkalität-m, m-Wert, Gesamtalkalität und Säurekapazität $K_{S4.3}$ sind identisch.
2. Die exakte Einhaltung des Probevolumens von 10 ml ist für die Genauigkeit des Analysenergebnisses entscheidend.
Sprachkürzel nach ISO 639-1
Revisionsstand
DE Methodenhandbuch 01/20

Durchführung der Messung

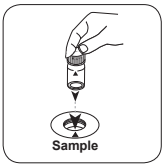
Durchführung der Bestimmung Säurekapazität $K_{S4.3}$ mit Tablette

Die Methode im Gerät auswählen.

Für diese Methode muss bei folgenden Geräten keine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

24-mm-Küvette mit **10 ml Probe** füllen.

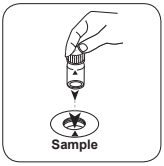
Küvette(n) verschließen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.

• • •

Tablette(n) durch Umschwenken lösen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.

Taste **TEST** (XD: **START**) drücken.

In der Anzeige erscheint das Ergebnis als Säurekapazität $K_{S4.3}$.

Mangan T **M240**

0,2 - 4 mg/L Mn **Mn**

Formaldoxim

DE

Material

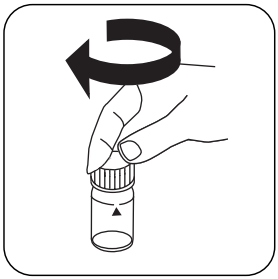
Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
Manganese LR 1	Tablette / 100	516080BT
Manganese LR 1	Tablette / 250	516081BT
Manganese LR 2	Tablette / 100	516090BT
Manganese LR 2	Tablette / 250	516091BT
Set Manganese LR 1/LR 2#	je 100	517621BT
Set Manganese LR 1/LR 2#	je 250	517622BT

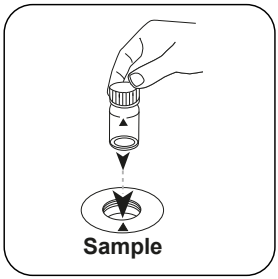
Durchführung der Bestimmung Mangan mit Tablette

Die Methode im Gerät auswählen.

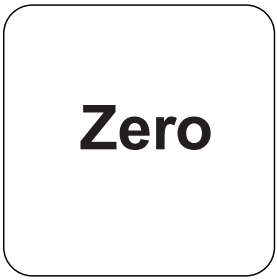
24-mm-Küvette mit **10 mL Probe** füllen.



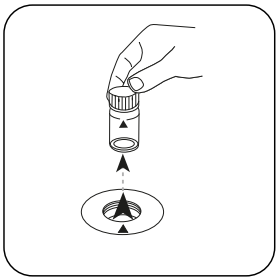
Küvette(n) verschließen.



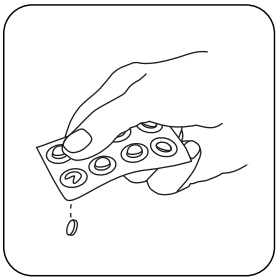
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



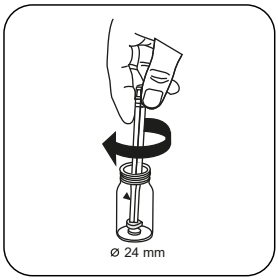
Taste **ZERO** drücken.



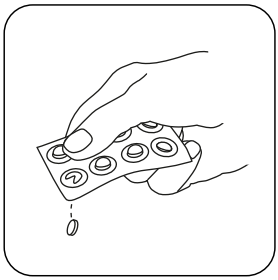
Küvette aus dem Messschacht nehmen.



Eine **MANGANESE LR 1 Tablette** zugeben.

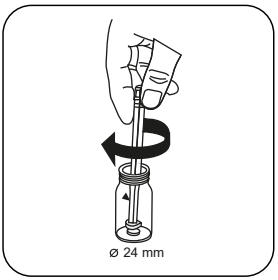


Die Tablette(n) unter leichter Drehung zerdrücken und lösen.

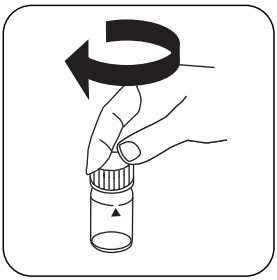


Eine **MANGANESE LR 2 Tablette** zugeben.

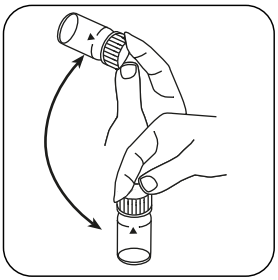
DE



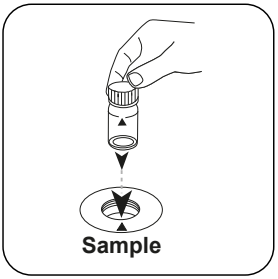
Tablette(n) unter leichter Drehung zerdrücken.



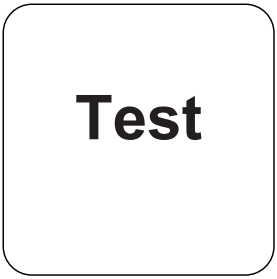
Küvette(n) verschließen.



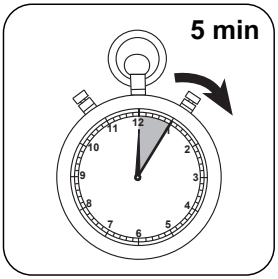
Tablette(n) durch Umschwenken lösen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



Taste **TEST** (XD: **START**) drücken.



5 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis in mg/L Mangan.

Auswertung

Die folgende Tabelle gibt an wie die ausgegebenen Werte in andere Zitierformen umgewandelt werden können.

Einheit	Zitierform	Umrechnungsfaktor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemische Methode

Formaldoxim

Appendix

Literaturverweise

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

Gemäß

DIN 38406-E2

inklusive Rührstab

Mangan LR PP M242

0,01 - 0,7 mg/L Mn Mn1

PAN

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
VARIO Manganese Reagent Set LR 10 ml	1 St.	535090
VARIO Rochelle Salzlösung, 30 ml [h)]	30 mL	530640

Vorbereitung

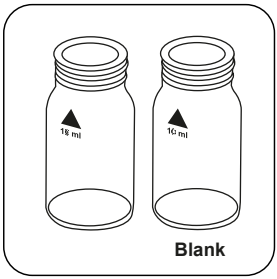
1. Sämtliche Laborgläser vor der Analyse mit einer verdünnten Salpetersäure und anschließend mit VE-Wasser spülen.
2. Stark gepufferte Wasserproben oder Wasserproben mit extremen pH-Werten können die Pufferkapazität der Reagenzien überschreiten und machen eine Einstellung des pH-Wertes erforderlich.
   Zwecks Konservierung angesäuerte Proben müssen vor der Analyse mit 5 mol/l (5N) Natriumhydroxid auf einen pH-Wert zwischen 4 und 5 eigestellt werden. Ein pH-Wert von 5 darf nicht überschritten werden, da es sonst zu Manganausfällungen kommen kann.

Anmerkungen

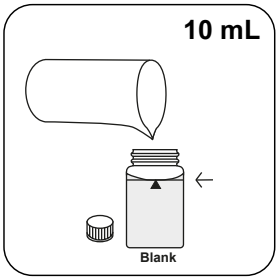
1. Enthält eine Probe mehr als 300 mg/L $CaCO_3$ Härte, werden nach Zugabe des Vario Ascorbic Acid Pulverpäckchens 10 Tropfen Rochelle Salzlösung zugegeben.
2. Bei einigen Proben kann nach Zugabe der Reagenz-Lösung "Alkaline-Cyanide" eine wolkige oder trübe Lösung entstehen. Nach Zugabe der PAN Indikator-Lösung sollte die Trübung verschwinden.
3. Enthält die Probe große Mengen an Eisen (ab 5 mg/L) muss eine Reaktionszeit von 10 Minuten eingehalten werden.

Durchführung der Bestimmung Mangan LR, mit Vario Pulverpäckchen

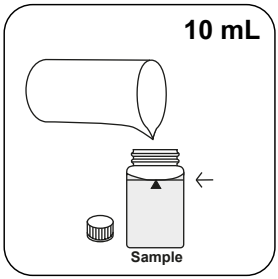
Die Methode im Gerät auswählen.



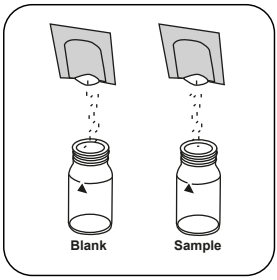
Zwei saubere 24-mm-Küvetten bereitstellen. Eine als Nullküvette kennzeichnen.



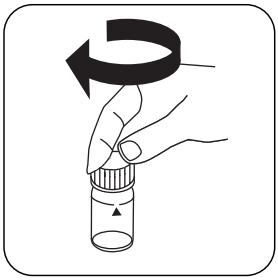
10 mL VE-Wasser in die Nullküvette geben.



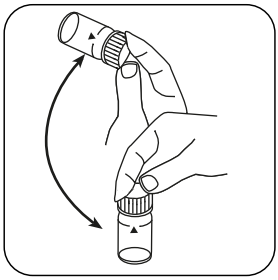
10 mL Probe in die Probenküvette geben.



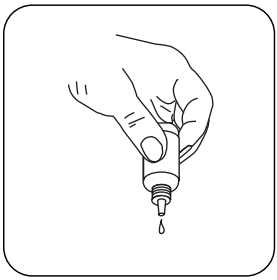
In jede Küvette **ein Vario Ascorbic Acid Pulverpäckchen** geben.



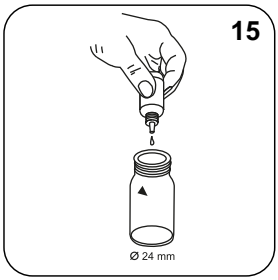
Küvette(n) verschließen.



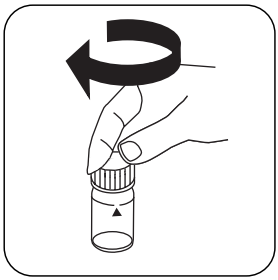
Inhalt durch Umschwenken mischen.



Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.

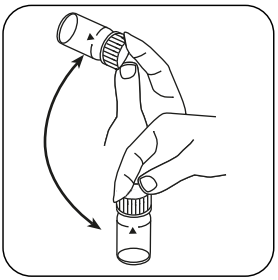


15 Tropfen Alkaline-Cyanide Reagenz zugeben.

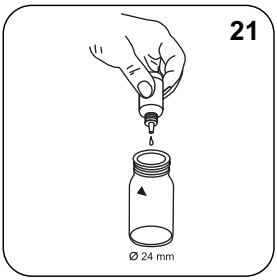


Küvette(n) verschließen.

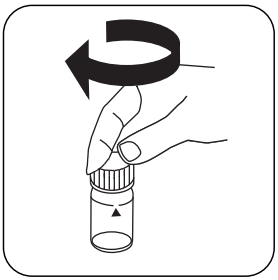
DE



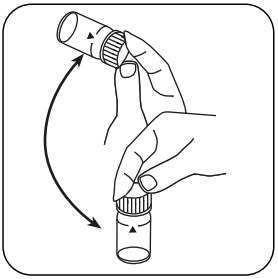
Inhalt durch Umschwenken mischen.



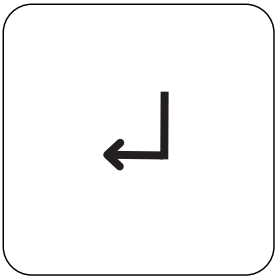
21 Tropfen PAN Indikator zugeben.



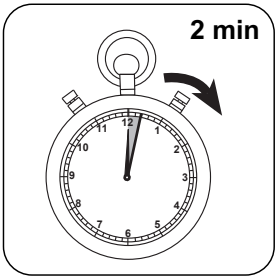
Küvette(n) verschließen.



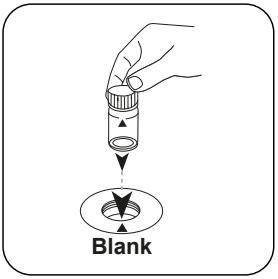
Inhalt durch Umschwenken mischen.



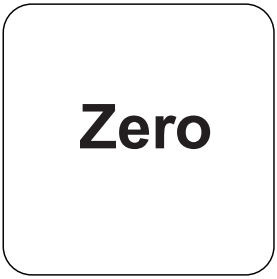
Taste **ENTER** drücken.



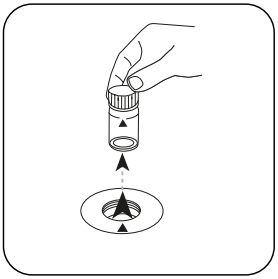
2 Minute(n) Reaktionszeit abwarten.



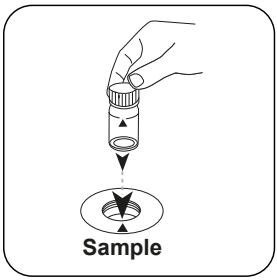
Die **Nullküvette** in den Messschacht stellen. Positionierung beachten.

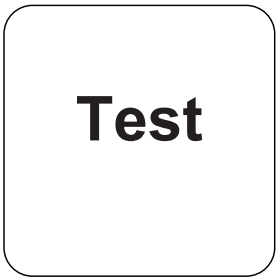


Taste **ZERO** drücken.



Küvette aus dem Messschacht nehmen.





Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.

Taste **TEST** (XD: **START**) drücken.

In der Anzeige erscheint das Ergebnis in mg/L Mangan.

Auswertung

Die folgende Tabelle gibt an wie die ausgegebenen Werte in andere Zitierformen umgewandelt werden können.

Einheit	Zitierform	Umrechnungsfaktor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemische Methode

PAN

Appendix

Literaturverweise

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h)] Hilfsreagenz, wird zusätzlich bei Proben mit Härte größer 300 mg/l $CaCO_3$ verwendet

Mangan HR PP M243

0,1 - 18 mg/L Mn Mn2

Periodatoxidation

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
VARIO Manganeses HR, Set High Range F10	1 Satz	535100

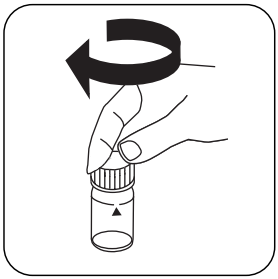
Vorbereitung

1. Stark gepufferte Wasserproben oder Wasserproben mit extremen pH-Werten können die Pufferkapazität der Reagenzien überschreiten und machen eine Einstellung des pH-Wertes erforderlich.
   Zwecks Konservierung angesäuerte Proben müssen vor der Analyse mit 5 mol/l (5N) Natriumhydroxid auf einen pH-Wert zwischen 4 und 5 eigestellt werden. Ein pH-Wert von 5 darf nicht überschritten werden, da es sonst zu Manganausfällungen kommen kann.

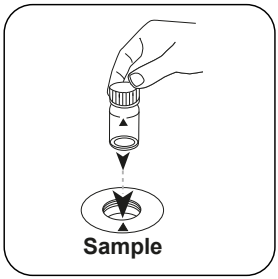
Durchführung der Bestimmung Mangan HR, mit Vario Pulverpäckchen

Die Methode im Gerät auswählen.

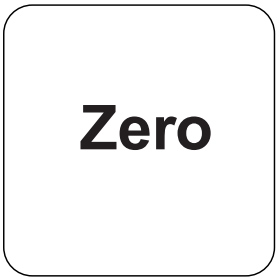
24-mm-Küvette mit **10 mL Probe** füllen.



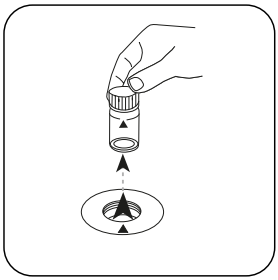
Küvette(n) verschließen.



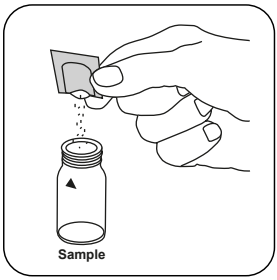
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



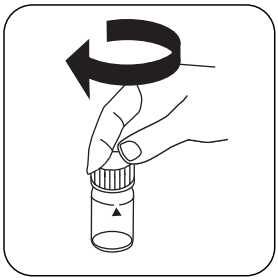
Taste **ZERO** drücken.



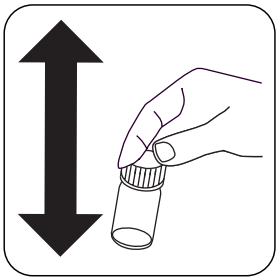
Küvette aus dem Messschacht nehmen.



Ein **Vario Manganese Citrate Buffer F10 Pulverpäckchen** zugeben.

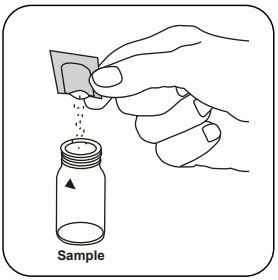


Küvette(n) verschließen.

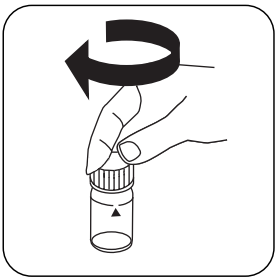


Inhalt durch Schütteln mischen.

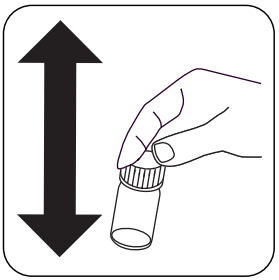
DE



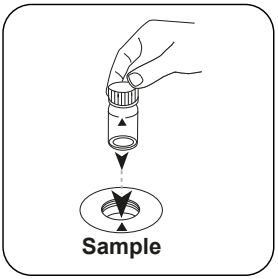
Ein **Vario Sodium Periodate F10 Pulverpäckchen** zugeben.



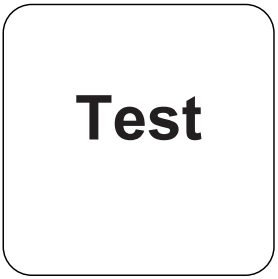
Küvette(n) verschließen.



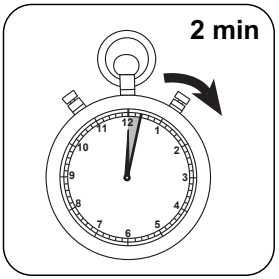
Inhalt durch Schütteln mischen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



Taste **TEST** (XD: **START**) drücken.



2 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis in mg/L Mangan.

Auswertung

Die folgende Tabelle gibt an wie die ausgegebenen Werte in andere Zitierformen umgewandelt werden können.

Einheit	Zitierform	Umrechnungsfaktor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemische Methode

Periodatoxidation

Appendix

Störungen

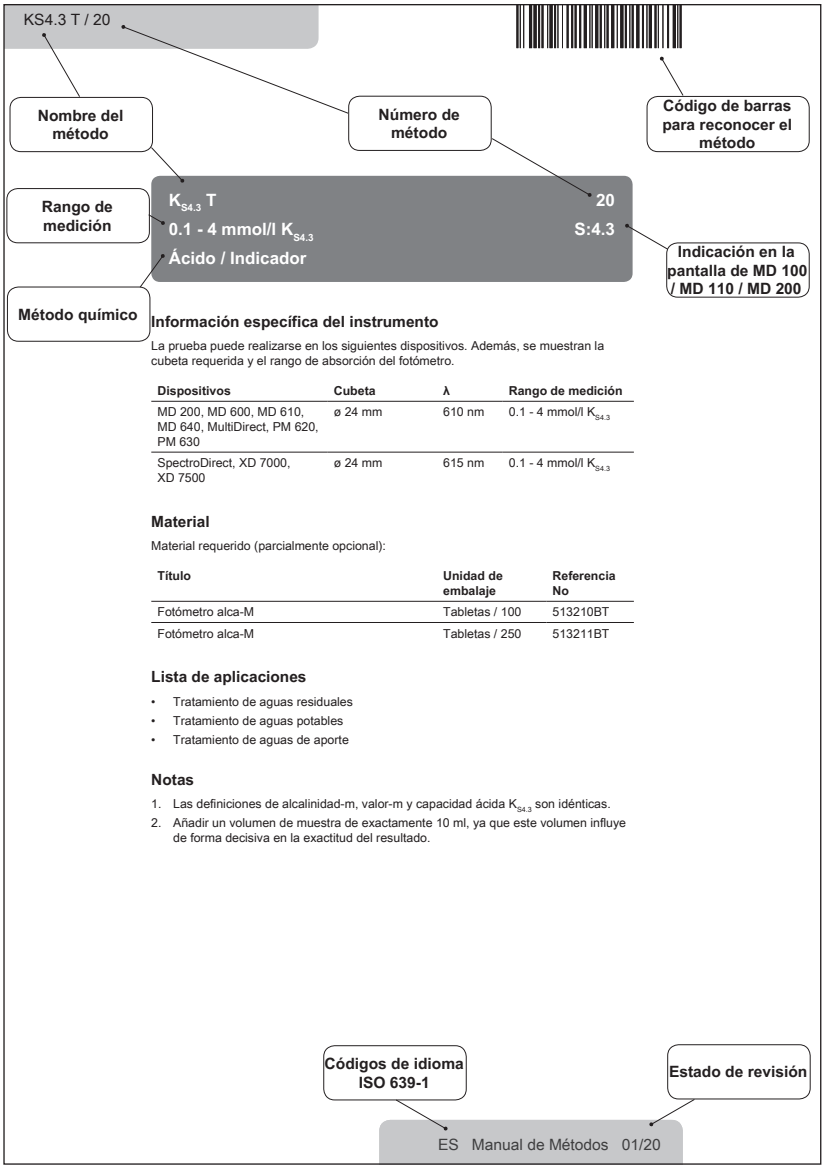
Störung	Stört ab / [mg/L]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

Methodenvalidierung

Nachweisgrenze	0.16 mg/L
Bestimmungsgrenze	0.49 mg/L
Messbereichsende	18 mg/L
Empfindlichkeit	13.02 mg/L / Abs
Vertrauensbereich	0.28 mg/L
Verfahrensstandardabweichung	0.12 mg/L
Verfahrensvariationskoeffizient	1.29 %

Gemäß

40 CFR 136 (US EPA approved HACH)



Información específica del instrumento

La prueba puede realizarse en los siguientes dispositivos. Además, se muestran la cubeta requerida y el rango de absorción del fotómetro.

Dispositivos	Cubeta	λ	Rango de medición
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

Material

Material requerido (parcialmente opcional):

Título	Unidad de embalaje	Referencia No
Fotómetro alca-M	Tabletas / 100	513210BT
Fotómetro alca-M	Tabletas / 250	513211BT

Lista de aplicaciones

- Tratamiento de aguas residuales
- Tratamiento de aguas potables
- Tratamiento de aguas de aporte

Notas

1. Las definiciones de alcalinidad-m, valor-m y capacidad ácida $K_{S4.3}$ son idénticas.
2. Añadir un volumen de muestra de exactamente 10 ml, ya que este volumen influye de forma decisiva en la exactitud del resultado.

Realización de la determinación

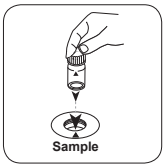
Ejecución de la determinación Capacidad ácida $K_{S4.3}$ con tableta

Seleccionar el método en el aparato.

Para este método no es necesario realizar medición CERO en los aparatos siguientes:
XD 7000, XD 7500

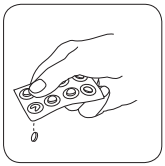
Llenar la cubeta de 24 mm con **10 ml de muestra** .

Cerrar la(s) cubeta(s).

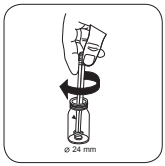


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



Triturar la(s) tableta(s) girando ligeramente.

Cerrar la(s) cubeta(s).

ES Manual de Métodos 01/20

Manganeso T **M240**

0.2 - 4 mg/L Mn **Mn**

Formaldoxim

ES

Material

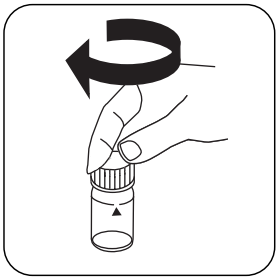
Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Manganeso LR 1	Tabletas / 100	516080BT
Manganeso LR 1	Tabletas / 250	516081BT
Manganeso LR 2	Tabletas / 100	516090BT
Manganeso LR 2	Tabletas / 250	516091BT
Juego manganeso LR 1/LR 2#	100 cada	517621BT
Juego manganeso LR 1/LR 2#	250 cada	517622BT

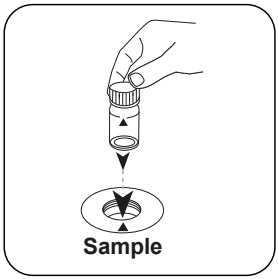
Ejecución de la determinación Manganeso con tableta

Seleccionar el método en el aparato.

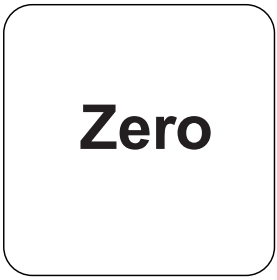
Llenar la cubeta de 24 mm con **10 mL de muestra** .



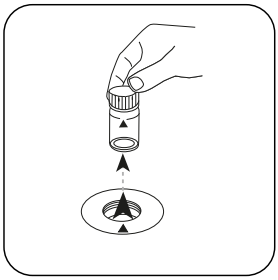
Cerrar la(s) cubeta(s).



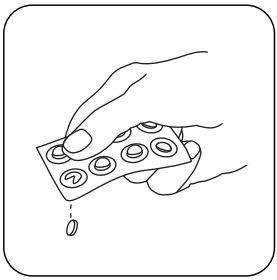
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



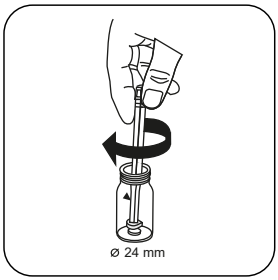
Pulsar la tecla **ZERO**.



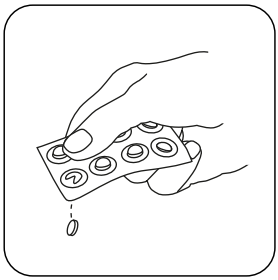
Extraer la cubeta del compartimiento de medición.



Añadir **tableta MANGANESE LR 1**.

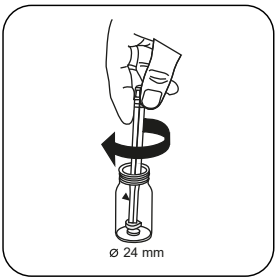


Triturar la(s) tableta(s) girando ligeramente y disolver.

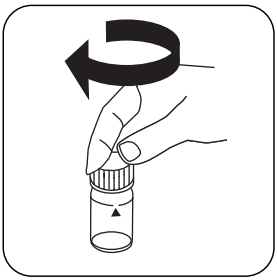


Añadir **tableta MANGANESE LR 2**.

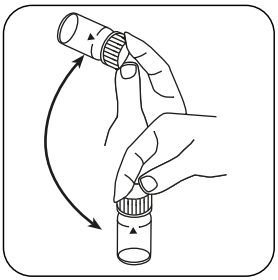
ES



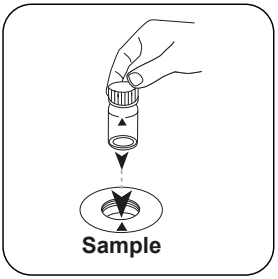
Triturar la(s) tableta(s) girando ligeramente.



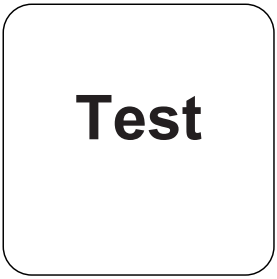
Cerrar la(s) cubeta(s).



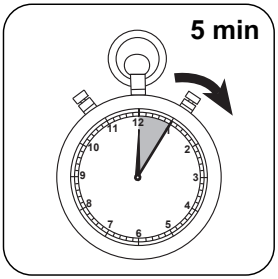
Disolver la(s) tableta(s) girando.



Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



Pulsar la tecla **TEST** (XD: **START**).



Esperar **5 minutos como periodo de reacción**.

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado en mg/L Manganeso.

Evaluación

La siguiente tabla muestra cómo los valores de salida se pueden convertir a otros formularios de citas.

Unidad	Conversión	Factor de conversión
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Método químico

Formaldoxim

Apéndice

Bibliografía

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

De acuerdo a

DIN 38406-E2

Manganeso LR PP M242

0.01 - 0.7 mg/L Mn Mn1

PAN

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Juego de reactivos para Manganeso LR 10 ml VARIO	1 Cantidad	535090
Solución salina Rochelle VARIO, 30 ml [h)]	30 mL	530640

Preparación

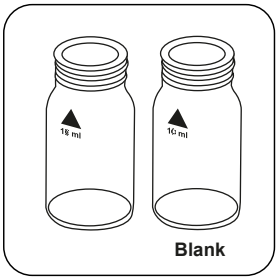
1. Antes de cada determinación, limpiar minuciosamente los aparatos de vidrio con ácido nítrico diluido, enjuagándolos a continuación con agua desionizada.
2. Las muestras acuosas altamente tamponadas o con valores de pH extremos pueden sobrepasar la capacidad tampón de los reactivos, por lo que será necesario un ajuste del valor de pH.
   Para conservar las muestras acidificadas, antes de realizar la determinación deben ajustarse a un valor de pH entre 4 y 5 usando 5 mol/l (5N) de hidróxido sódico.
   No debe superarse un valor de pH de 5, ya que puede causar precipitaciones de manganeso.

Notas

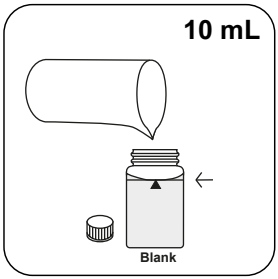
1. Si una muestra contiene más de 300 mg/L de dureza de $CaCO_3$, después de añadir el polvo Vario Ascorbic Acid, se ponen además 10 gotas de solución de Rochelle.
2. En algunas muestras puede aparecer un enturbiamiento después de añadir la solución reactiva "Alkaline-Cyanide". Dicho enturbiamiento deberá desaparecer después de añadir la solución de indicador PAN.
3. Prolongar el periodo de reacción a 10 minutos cuando la muestra contenga gran concentración de hierro (mayor de 5 mg/L).

Ejecución de la determinación Manganeso LR con sobres de polvos Vario

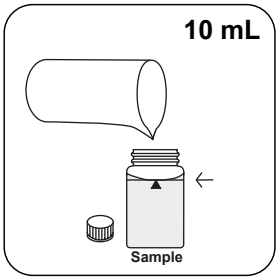
Seleccionar el método en el aparato.



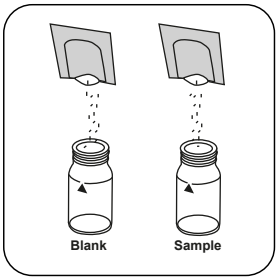
Preparar dos cubetas limpias de 24 mm. Identificar una como cubeta en blanco.



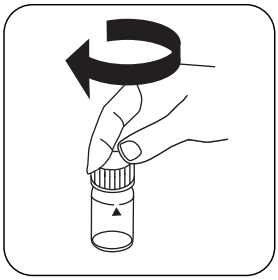
Añadir **10 mL de agua desionizada** en la cubeta en blanco.



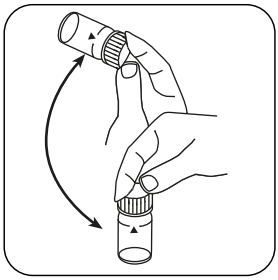
Añadir **10 mL de muestra** en la cubeta con la muestra.



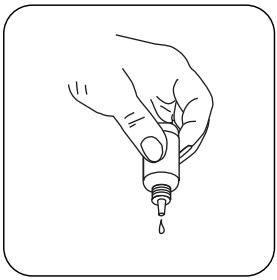
Añadir **un sobre de polvos de Vario Ascorbic Acid** en cada cubeta.



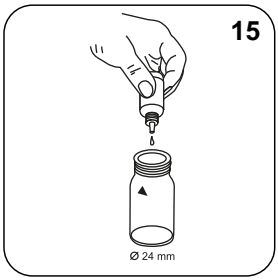
Cerrar la(s) cubeta(s).



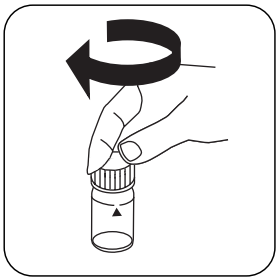
Mezclar el contenido girando.



Mantener la botella cuentagotas vertical y añadir gotas del mismo tamaño presionando lentamente.

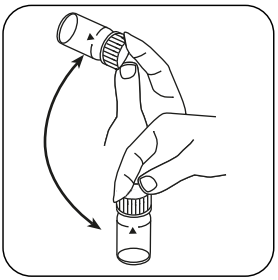


Añadir **15 gotas de Alkaline-Cyanide Reagenz**.

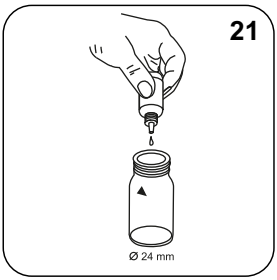


Cerrar la(s) cubeta(s).

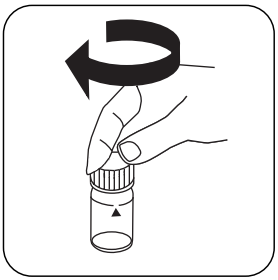
ES



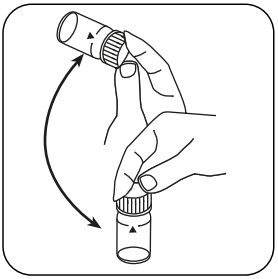
Mezclar el contenido girando.



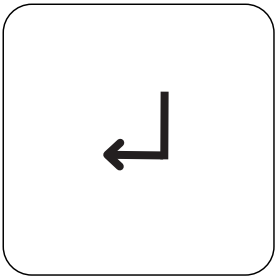
Añadir **21 gotas de PAN Indikator**.



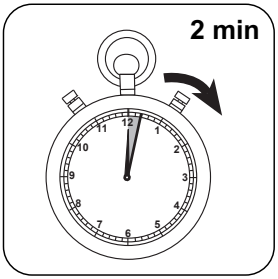
Cerrar la(s) cubeta(s).



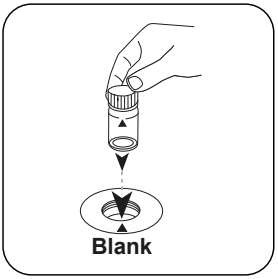
Mezclar el contenido girando.



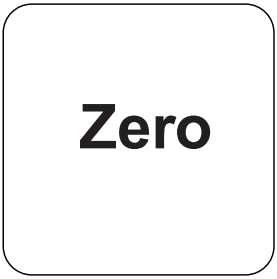
Pulsar la tecla **ENTER**.



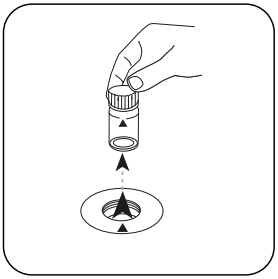
Esperar **2 minutos como periodo de reacción**.



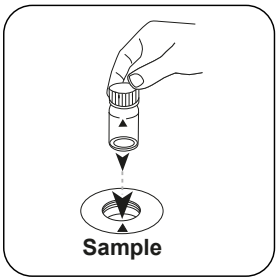
Poner la **cubeta en blanco** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



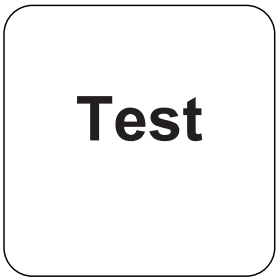
Pulsar la tecla **ZERO**.



Extraer la cubeta del compartimiento de medición.



Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



Pulsar la tecla **TEST** (XD: **START**).

A continuación se visualizará el resultado en mg/L Manganeso.

Evaluación

La siguiente tabla muestra cómo los valores de salida se pueden convertir a otros formularios de citas.

Unidad	Conversión	Factor de conversión
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

ES

Método químico

PAN

Apéndice

Bibliografía

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h] Utilización para análisis con dureza mayor a 300 mg/l $CaCO_3$

Manganeso HR PP M243

0.1 - 18 mg/L Mn Mn2

Oxidación peryodato

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Manganeso HR VARIO, juego campo de medición alto F10	1 Set	535100

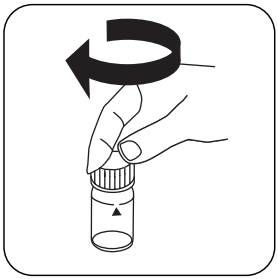
Preparación

1. Las muestras acuosas altamente tamponadas o con valores de pH extremos pueden sobrepasar la capacidad tampón de los reactivos, por lo que será necesario un ajuste del valor de pH.
   Para conservar las muestras acidificadas, antes de realizar la determinación deben ajustarse a un valor de pH entre 4 y 5 usando 5 mol/l (5N) de hidróxido sódico.
   No debe superarse un valor de pH de 5, ya que puede causar precipitaciones de manganeso.

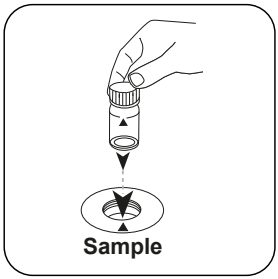
Ejecución de la determinación Manganeso HR, con sobres de polvos Vario

Seleccionar el método en el aparato.

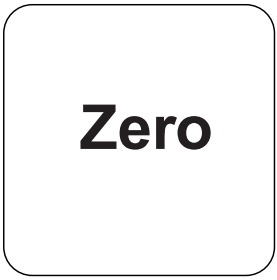
Llenar la cubeta de 24 mm con **10 mL de muestra** .



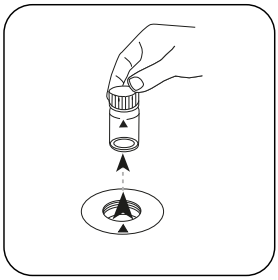
Cerrar la(s) cubeta(s).



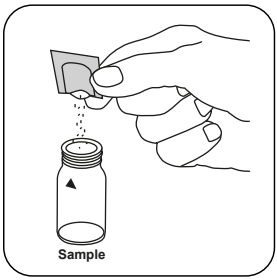
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



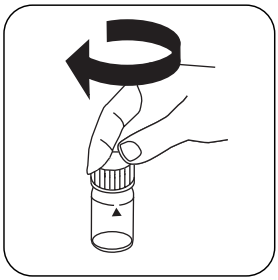
Pulsar la tecla **ZERO**.



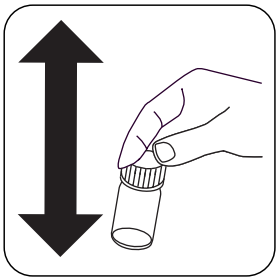
Extraer la cubeta del compartimiento de medición.



Añadir un **sobre de polvos Vario Manganese Citrate Buffer F10** .

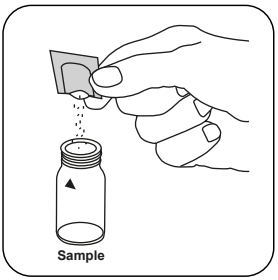


Cerrar la(s) cubeta(s).

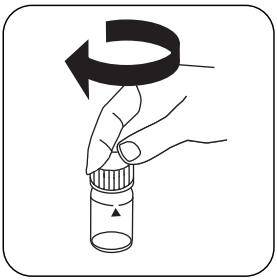


Mezclar el contenido agitando.

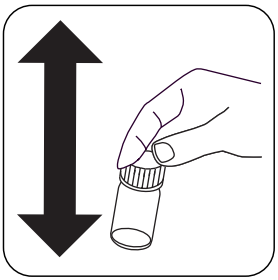
ES



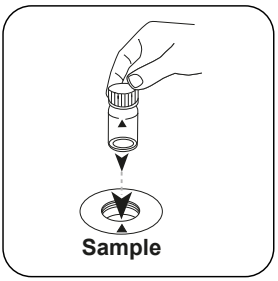
Añadir un **sobre de polvos Vario Sodium Periodate F10** .



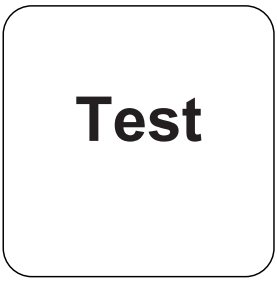
Cerrar la(s) cubeta(s).



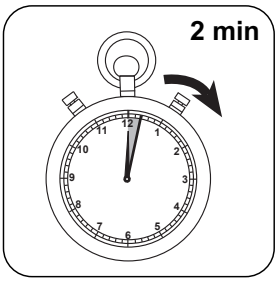
Mezclar el contenido agitando.



Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



Pulsar la tecla **TEST** (XD: **START**).



Esperar **2 minutos como periodo de reacción**.

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado en mg/L Manganeso.

Evaluación

La siguiente tabla muestra cómo los valores de salida se pueden convertir a otros formularios de citas.

Unidad	Conversión	Factor de conversión
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Método químico

Oxidación peryodato

Apéndice

Interferencia

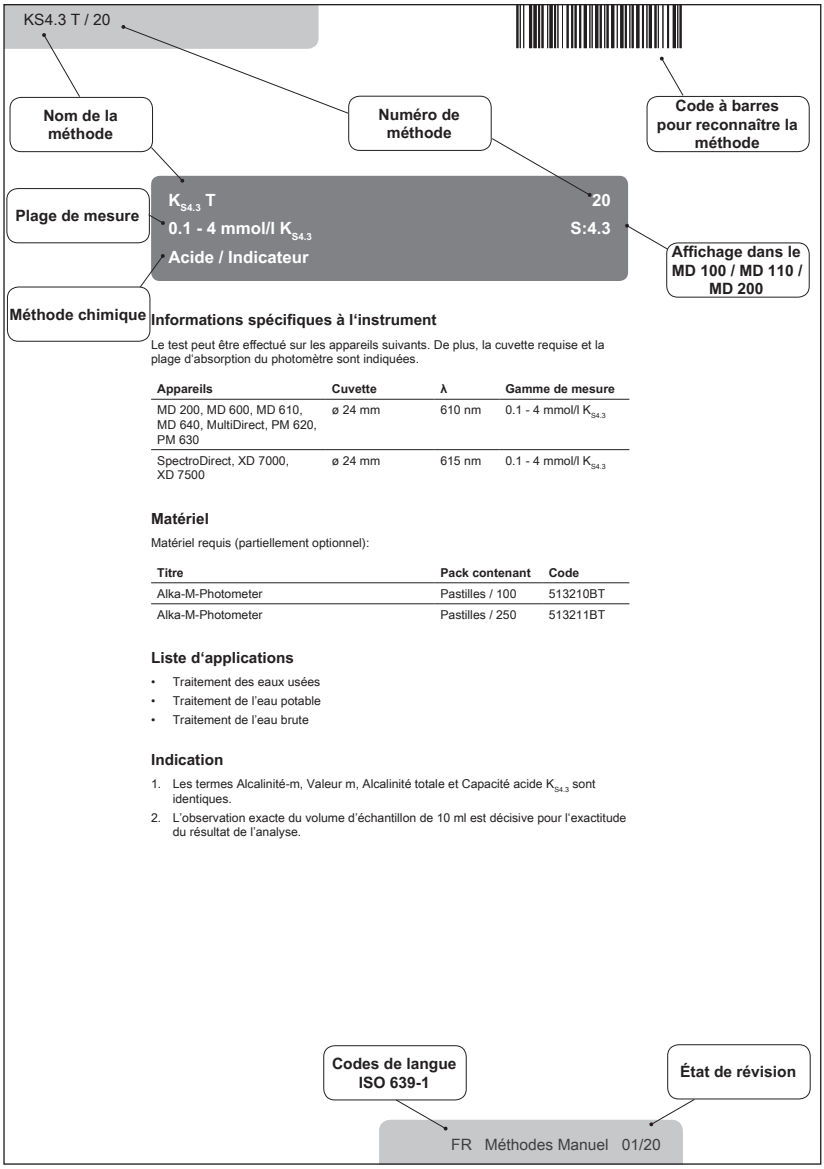
Interferencia	de / [mg/L]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

Validación del método

Límite de detección	0.16 mg/L
Límite de determinación	0.49 mg/L
Límite del rango de medición	18 mg/L
Sensibilidad	13.02 mg/L / Abs
Intervalo de confianza	0.28 mg/L
Desviación estándar	0.12 mg/L
Coeficiente de variación	1.29 %

De acuerdo a

40 CFR 136 (US EPA approved HACH)


KS4.3 T / 20
Nom de la méthode
Numéro de méthode
Code à barres pour reconnaître la méthode
Plage de mesure
$K_{S4.3}$ T
20
0.1 - 4 mmol/l $K_{S4.3}$
S:4.3
Acide / Indicateur
Affichage dans le MD 100 / MD 110 / MD 200
Méthode chimique
Informations spécifiques à l'instrument
Le test peut être effectué sur les appareils suivants. De plus, la cuvette requise et la plage d'absorption du photomètre sont indiquées.
Appareils | Cuvette | λ | Gamme de mesure
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630 | ø 24 mm | 610 nm | 0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500 | ø 24 mm | 615 nm | 0.1 - 4 mmol/l $K_{S4.3}$
Matériel
Matériel requis (partiellement optionnel):
Titre | Pack contenant | Code
Alka-M-Photometer | Pastilles / 100 | 513210BT
Alka-M-Photometer | Pastilles / 250 | 513211BT
Liste d'applications
• Traitement des eaux usées
• Traitement de l'eau potable
• Traitement de l'eau brute
Indication
1. Les termes Alcalinité-m, Valeur m, Alcalinité totale et Capacité acide $K_{S4.3}$ sont identiques.
2. L'observation exacte du volume d'échantillon de 10 ml est décisive pour l'exactitude du résultat de l'analyse.
Codes de langue ISO 639-1
État de révision
FR Méthodes Manuel 01/20

Procédure du test

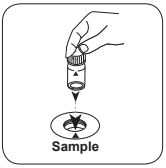
Réalisation de la quantification Capacité acide $K_{S4.3}$ avec pastille

Sélectionnez la méthode sur l'appareil.

Cette méthode ne nécessite aucune mesure du zéro sur les appareils suivants : XD 7000, XD 7500

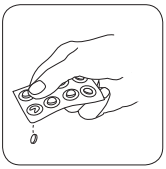
Remplissez une cuvette de 24 mm de **10 ml d'échantillon**.

Fermez la(les) cuvette(s).

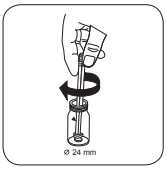


Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.

• • •



Ajoutez une **pastille de ALKA-M-PHOTOMETER**.



Écrasez la(les) pastille(s) en la(les) tournant un peu.

Fermez la(les) cuvette(s).

Manganèse T **M240**

0.2 - 4 mg/L Mn **Mn**

Formaldoxime

FR

Matériel

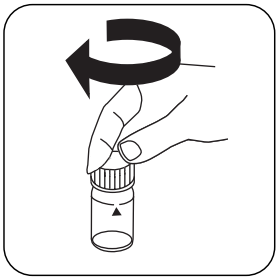
Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
Manganèse LR 1	Pastilles / 100	516080BT
Manganèse LR 1	Pastilles / 250	516081BT
Manganèse LR 2	Pastilles / 100	516090BT
Manganèse LR 2	Pastilles / 250	516091BT
Kit manganèse LR 1/LR 2#	100 chacun	517621BT
Kit manganèse LR 1/LR 2#	250 chacun	517622BT

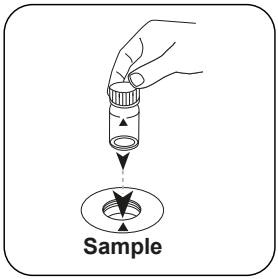
Réalisation de la quantification Manganèse avec pastille

Sélectionnez la méthode sur l'appareil.

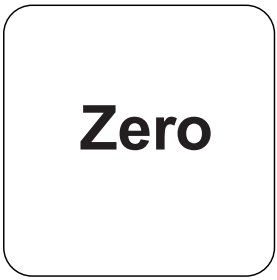
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



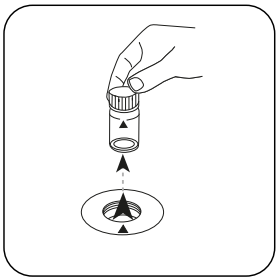
Fermez la(les) cuvette(s).



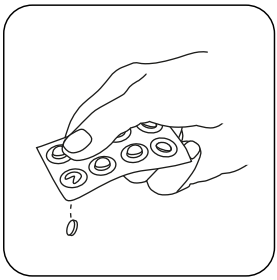
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



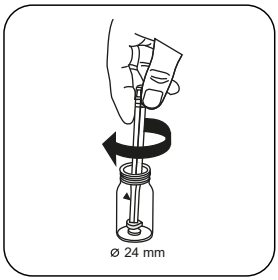
Appuyez sur la touche **ZERO**.



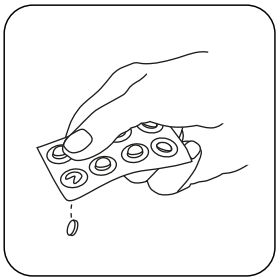
Retirez la cuvette de la chambre de mesure.



Ajoutez une **pastille de MANGANESE LR 1**.

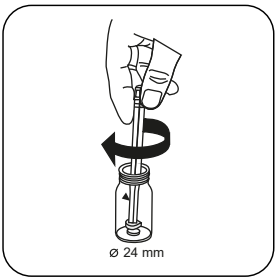


Écrasez et dissolvez la(les) pastille(s) en la(les) tournant un peu.

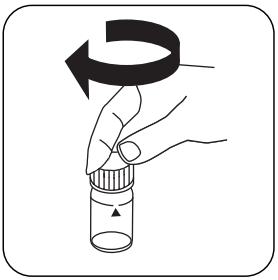


Ajoutez une **pastille de MANGANESE LR 2**.

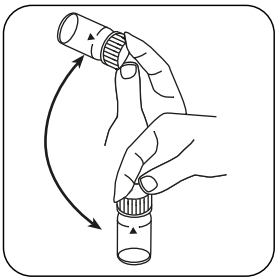
FR



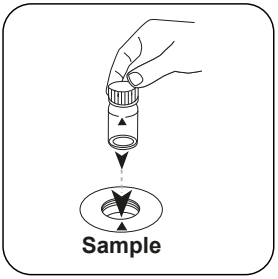
Écrasez la(les) pastille(s) en la(les) tournant un peu.



Fermez la(les) cuvette(s).

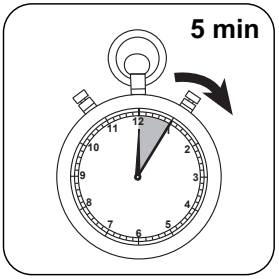


Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure.
Attention à la positionner correctement.

Appuyez sur la touche **TEST** (XD: **START**).



Attendez la fin du **temps de réaction de 5 minute(s)** .

À l'issue du temps de réaction, la mesure est effectuée automatiquement.

Le résultat s'affiche à l'écran en mg/L Manganèse.

Analyses

Le tableau suivant identifie les valeurs de sortie qui peuvent être converties en d'autres formes de citation.

Unité	Formes de citation	Facteur de conversion
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Méthode chimique

Formaldoxime

Appendice

Bibliographie

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

Selon

DIN 38406-E2

[1] # agitateur inclus

Manganèse LR PP M242

0.01 - 0.7 mg/L Mn Mn1

PAN

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
VARIO manganèse kit de réactifs LR 10 ml	1 Pièces	535090
VARIO Solution saline Rochelle, 30 ml [h)]	30 mL	530640

Préparation

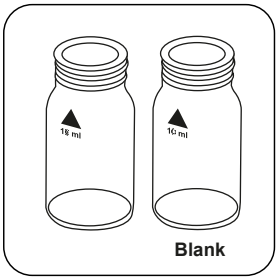
1. Avant l'analyse, lavez tous les instruments en verre en utilisant une solution d'acide chlorhydrique diluée puis rincez-les à l'eau déminéralisée.
2. Les échantillons d'eau fortement tamponnés ou les échantillons d'eau présentant des pH extrêmes, peuvent dépasser la capacité tampon des réactifs et nécessitent un ajustage du pH.
   Avant l'analyse, les échantillons acidifiés en vue de la conservation doivent être ajustés sur un pH compris entre 4 et 5 en ajoutant 5 mol/l (5N) d'hydroxyde de sodium. Ne pas dépasser un pH de 5 pour empêcher les précipités de manganèse.

Indication

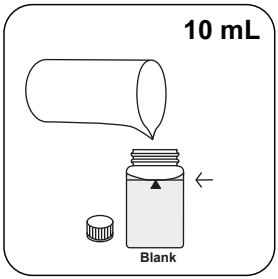
1. Si un échantillon a une dureté supérieure à 300 mg/L $CaCO_3$, 10 gouttes d'une solution saline Rochelle sont ajoutées après l'introduction du sachet de poudre Vario Ascorbic Acid.
2. Sur certains échantillons, il peut se former une solution d'aspect nuageux ou trouble après l'apport de la solution de réactif « Cyanures alcalins ». Après l'apport de la solution à réactif indicateur PAN, le trouble devrait disparaître.
3. Si l'échantillon contient du fer en grande quantité (à partir de 5 mg/L), respectez un temps de réaction de 10 minutes.

Réalisation de la quantification Manganèse LR avec sachet de poudre Vario

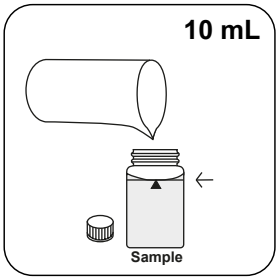
Sélectionnez la méthode sur l'appareil.



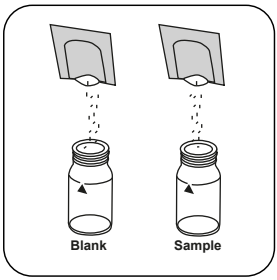
Préparez deux cuvettes propres de 24 mm. L'une des deux cuvettes sera la cuvette du blanc. Étiquetez-la.



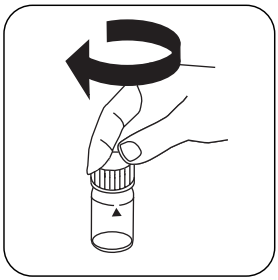
Versez **10 mL d'eau déminéralisée** dans la cuvette du blanc.



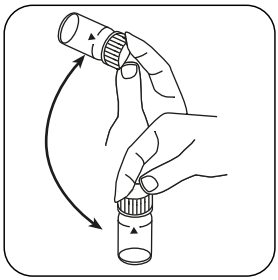
Versez **10 mL d'échantillon** dans la cuvette réservée à l'échantillon.



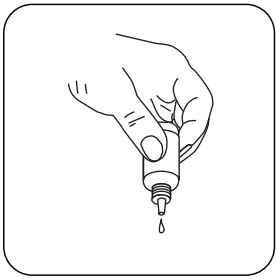
Dans chaque cuvette, versez **un sachet de poudre Vario Ascorbic Acid**.



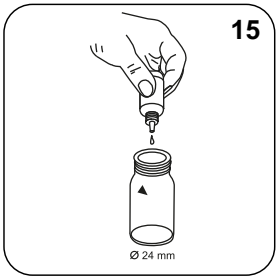
Fermez la(les) cuvette(s).



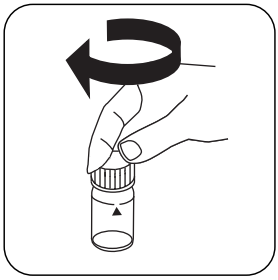
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



Tenez les flacons compte-goutte à la verticale et ajoutez des gouttes uniformes en appuyant lentement.

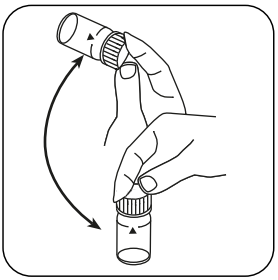


Ajoutez **15 gouttes de Alkaline-Cyanide Reagenz**.

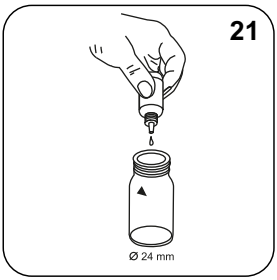


Fermez la(les) cuvette(s).

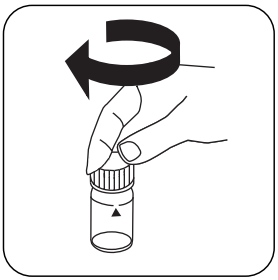
FR



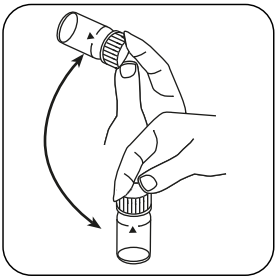
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



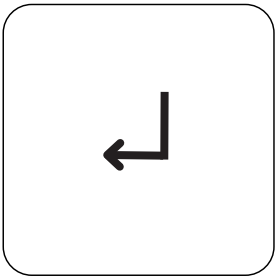
Ajoutez **21 gouttes de PAN Indikator**.



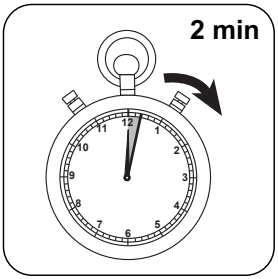
Fermez la(les) cuvette(s).



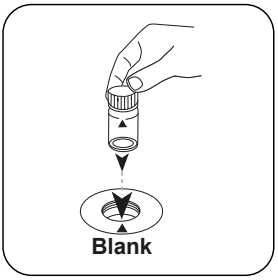
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



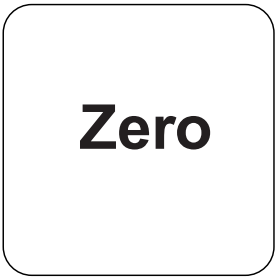
Appuyez sur la touche **ENTER**.



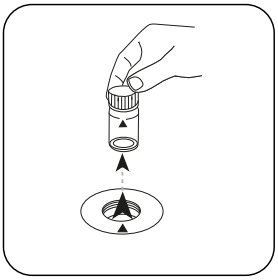
Attendez la fin du **temps de réaction de 2 minute(s)** .



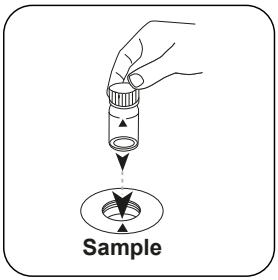
Placez la **cuvette du blanc** dans la chambre de mesure. Attention à la positionner correctement.

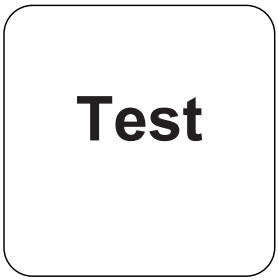


Appuyez sur la touche **ZERO**.



Retirez la cuvette de la chambre de mesure.





Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.

Appuyez sur la touche **TEST** (XD: **START**).

Le résultat s'affiche à l'écran en mg/L Manganèse.

Analyses

Le tableau suivant identifie les valeurs de sortie qui peuvent être converties en d'autres formes de citation.

Unité	Formes de citation	Facteur de conversion
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

FR

Méthode chimique

PAN

Appendice

Bibliographie

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h] Utilisation pour des échantillons d'une dureté supérieure à 300 mg/l $CaCO_3$

Manganèse HR PP M243

0.1 - 18 mg/L Mn Mn2

Oxydation par le pérodiat

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
VARIO manganèse HR, kit High Range F10	1 Kit	535100

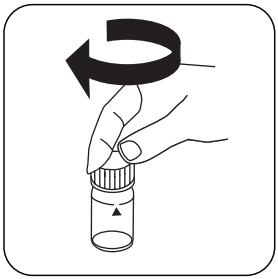
Préparation

1. Les échantillons d'eau fortement tamponnés ou les échantillons d'eau présentant des pH extrêmes, peuvent dépasser la capacité tampon des réactifs et nécessitent un ajustage du pH.
   Avant l'analyse, les échantillons acidifiés en vue de la conservation doivent être ajustés sur un pH compris entre 4 et 5 en ajoutant 5 mol/l (5N) d'hydroxyde de sodium. Ne pas dépasser un pH de 5 pour empêcher les précipités de manganèse.

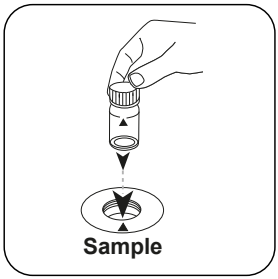
Réalisation de la quantification Manganèse HR avec sachet de poudre Vario

Sélectionnez la méthode sur l'appareil.

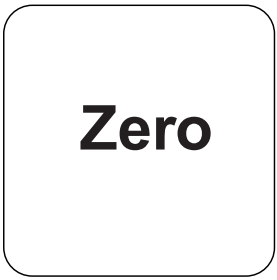
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



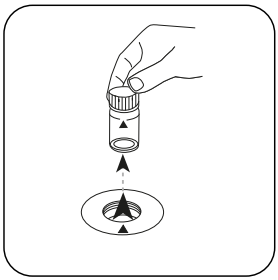
Fermez la(les) cuvette(s).



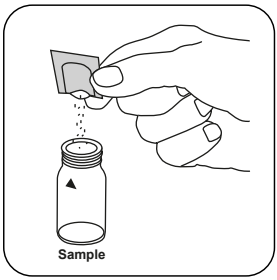
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



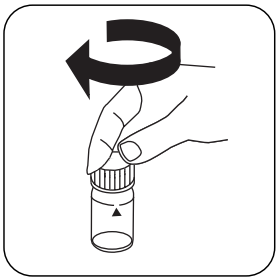
Appuyez sur la touche **ZERO**.



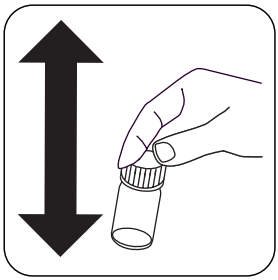
Retirez la cuvette de la chambre de mesure.



Ajoutez un **sachet de poudre Vario Manganese Citrate Buffer F10**.

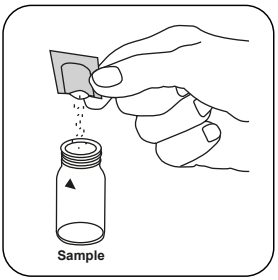


Fermez la(les) cuvette(s).

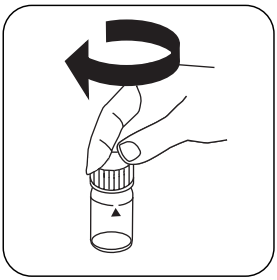


Mélangez le contenu en agitant.

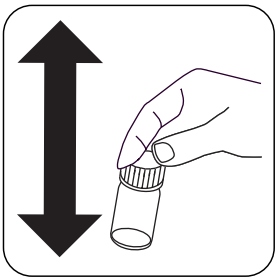
FR



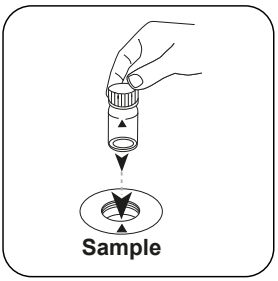
Ajoutez un **sachet de poudre Vario Sodium Periodate F10**.



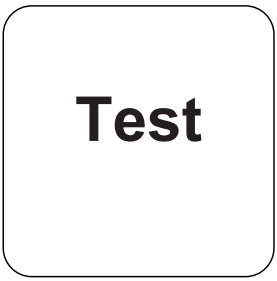
Fermez la(les) cuvette(s).



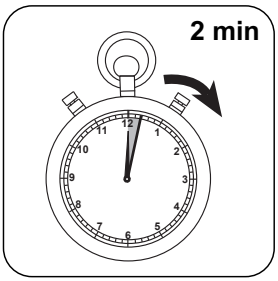
Mélangez le contenu en agitant.



Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure.
Attention à la positionner correctement.



Appuyez sur la touche **TEST** (XD: **START**).



Attendez la fin du **temps de réaction de 2 minute(s)** .

À l'issue du temps de réaction, la mesure est effectuée automatiquement.

Le résultat s'affiche à l'écran en mg/L Manganèse.

Analyses

Le tableau suivant identifie les valeurs de sortie qui peuvent être converties en d'autres formes de citation.

Unité	Formes de citation	Facteur de conversion
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Méthode chimique

Oxydation par le pérodiat

Appendice

Interférences

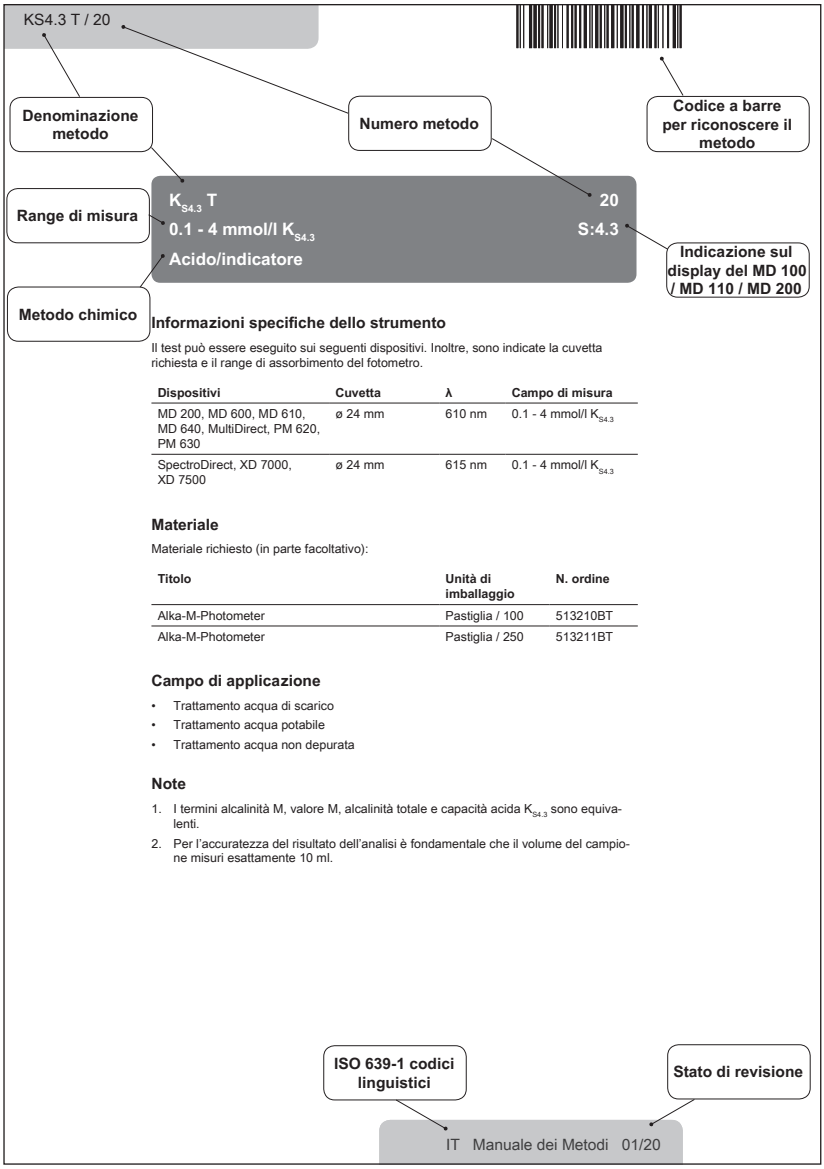
Interférences	de / [mg/L]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

Méthode Validation

Limite de détection	0.16 mg/L
Limite de détermination	0.49 mg/L
Fin de la gamme de mesure	18 mg/L
Sensibilité	13.02 mg/L / Abs
Intervalle de confiance	0.28 mg/L
Déviation standard	0.12 mg/L
Coefficient de variation	1.29 %

Selon

40 CFR 136 (US EPA approved HACH)



Informazioni specifiche dello strumento

Il test può essere eseguito sui seguenti dispositivi. Inoltre, sono indicate la cuvetta richiesta e il range di assorbimento del fotometro.

Dispositivi	Cuvetta	λ	Campo di misura
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

Materiale

Materiale richiesto (in parte facoltativo):

Titolo	Unità di imballaggio	N. ordine
Alka-M-Photometer	Pastiglia / 100	513210BT
Alka-M-Photometer	Pastiglia / 250	513211BT

Campo di applicazione

- Trattamento acqua di scarico
- Trattamento acqua potabile
- Trattamento acqua non depurata

Note

1. I termini alcalinità M, valore M, alcalinità totale e capacità acida $K_{S4.3}$ sono equivalenti.
2. Per l'accuratezza del risultato dell'analisi è fondamentale che il volume del campione misuri esattamente 10 ml.

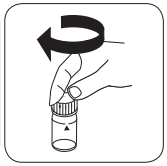
Svolgimento della misurazione

Esecuzione della rilevazione Capacità acida $K_{S4.3}$ con pastiglia

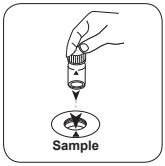
Selezionare il metodo nel dispositivo.

Con i seguenti dispositivi, per questo metodo non è necessario eseguire una misurazione ZERO: XD 7000, XD 7500

Riempire una cuvetta da 24 mm con **10 ml di campione**.



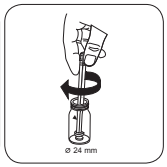
Chiudere la/e cuvetta/e.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.

• • •

Aggiungere **una pastiglia ALKA-M-PHOTOMETER**.



Frantumare la/e pastiglia/e con una leggera rotazione.

Chiudere la/e cuvetta/e.

Manganese T M240

0.2 - 4 mg/L Mn Mn

Formaldossima

IT

Materiale

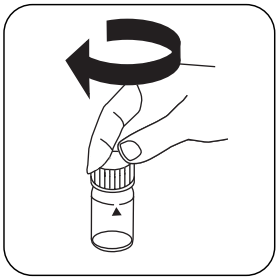
Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
Manganese LR 1	Pastiglia / 100	516080BT
Manganese LR 1	Pastiglia / 250	516081BT
Manganese LR 2	Pastiglia / 100	516090BT
Manganese LR 2	Pastiglia / 250	516091BT
Set Manganese LR 1/LR 2#	ciascuna 100	517621BT
Set Manganese LR 1/LR 2#	ciascuna 250	517622BT

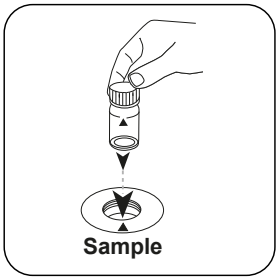
Esecuzione della rilevazione Manganese con pastiglia

Selezionare il metodo nel dispositivo.

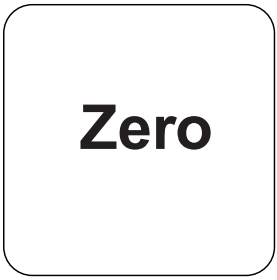
Riempire una cuvetta da 24 mm con **10 mL di campione**.



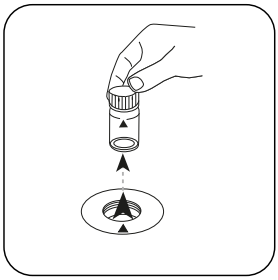
Chiudere la/e cuvetta/e.



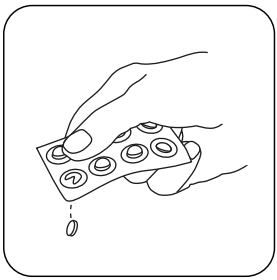
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



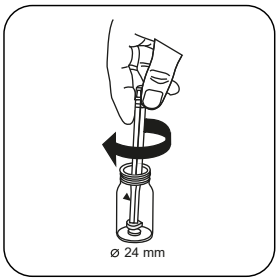
Premere il tasto **ZERO**.



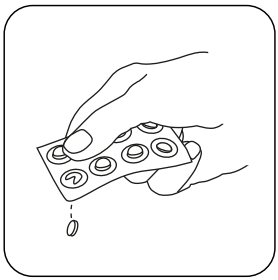
Prelevare la cuvetta dal vano di misurazione.



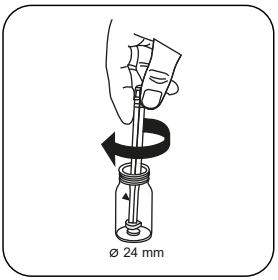
Aggiungere **una pastiglia MANGANESE LR 1**.



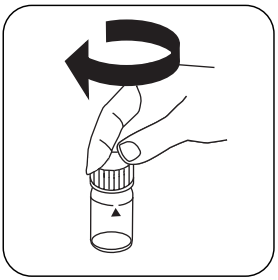
Frantumare e far sciogliere la/e pastiglia/e con una leggera rotazione.



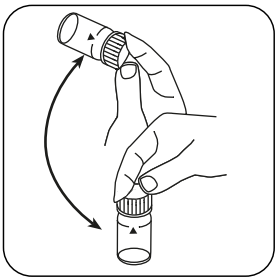
Aggiungere **una pastiglia MANGANESE LR 2**.



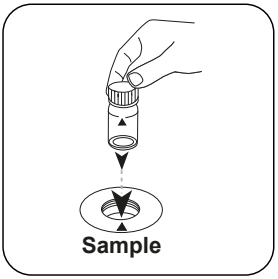
Frantumare la/e pastiglia/e con una leggera rotazione.



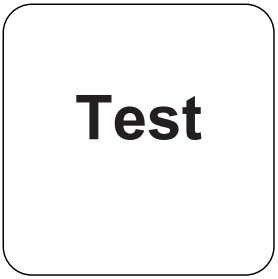
Chiudere la/e cuvetta/e.



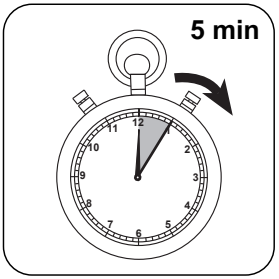
Far sciogliere la/e pastiglia/e agitando.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Premere il tasto **TEST** (XD: **START**).



Attendere un **tempo di reazione di 5 minuto/i** .

Allo scadere del tempo di reazione viene effettuata automaticamente la misurazione.

Sul display compare il risultato in mg/L di Manganese.

Valutazione

La seguente tabella identifica i valori di output che possono essere convertiti in altre forme di citazione.

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Metodo chimico

Formaldossima

Appendice

Riferimenti bibliografici

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

Secondo

DIN 38406-E2

[1] *Bacchetta compresa

Manganese LR PP M242

0.01 - 0.7 mg/L Mn Mn1

PAN

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
VARIO Manganese Reagent Set LR 10 ml	1 pz.	535090
VARIO Rochelle soluzione salina, 30 ml [h)]	30 mL	530640

Preparazione

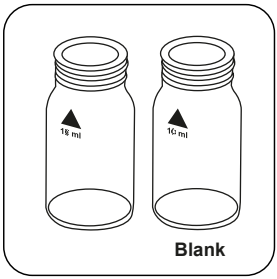
1. Prima dell'analisi sciacquare tutti i vetri di laboratorio con una soluzione di acido cloridrico diluita e successivamente con acqua demineralizzata.
2. I campioni di acqua fortemente tamponati o i campioni di acqua con valori di pH estremi possono superare il potere tamponante dei reagenti e rendono necessaria una regolazione del valore del pH.
   I campioni acidificati per la conservazione devono essere regolati prima dell'analisi su un valore di pH compreso tra 4 e 5 con 5 mol/l (5N) di biossido di sodio. Non superare il valore di pH 5 per evitare precipitazioni di manganese.

Note

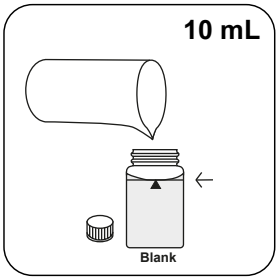
1. Se un campione ha una durezza di più di 300 mg/L di $CaCO_3$, dopo l'aggiunta della polvere Vario Ascorbic Acid si aggiungono 10 gocce di soluzione salina Rochelle.
2. In alcuni campioni dopo l'aggiunta della soluzione reagente "Alkaline-Cyanide" può formarsi una soluzione velata o torbida. Dopo l'aggiunta della soluzione di indicatore PAN la torbidità dovrebbe scomparire.
3. Se il campione contiene grandi quantità di ferro (a partire da 5 mg/L) è necessario osservare un tempo di reazione di 10 minuti.

Esecuzione della rilevazione Manganese LR con polvere in bustine Vario

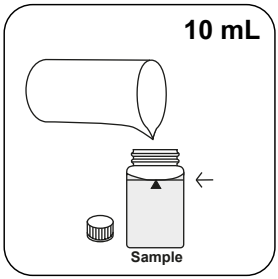
Selezionare il metodo nel dispositivo.



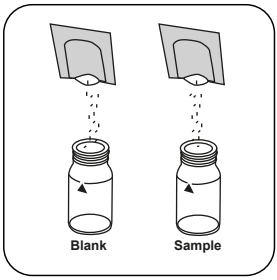
Preparare due cuvette pulite da 24 mm. Contrassegnare una cuvetta come cuvetta zero.



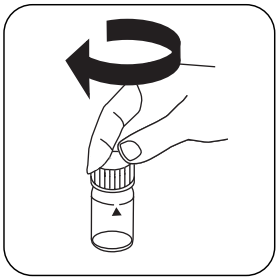
Immettere **10 mL di acqua demineralizzata** nella cuvetta zero.



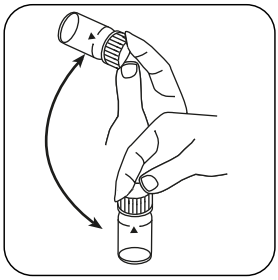
Immettere **10 mL di campione** nella cuvetta del campione.



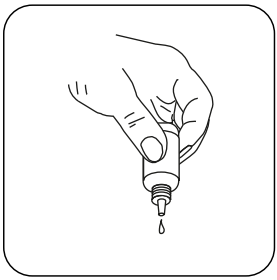
Immettere **una bustina di polvere Vario Ascorbic Acid** in ogni cuvetta.



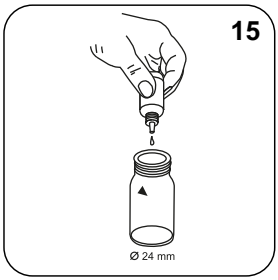
Chiudere la/e cuvetta/e.



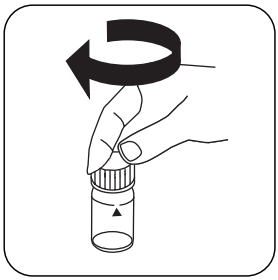
Miscelare il contenuto capovolgendo.



Tenere le boccette contagocce in posizione verticale e introdurre, premendo lentamente, gocce della stessa dimensione nella cuvetta.

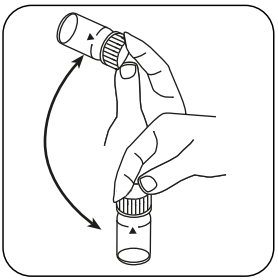


Aggiungere **15 gocce di Alkaline-Cyanide Reagenz**.

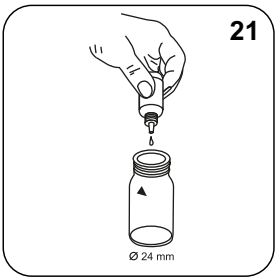


Chiudere la/e cuvetta/e.

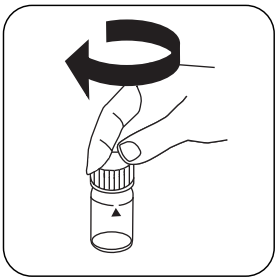
IT



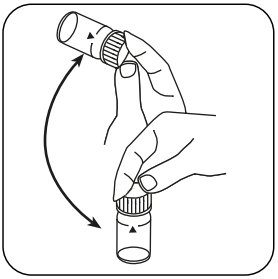
Miscelare il contenuto capovolgendo.



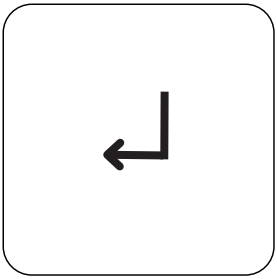
Aggiungere **21 gocce di PAN Indikator**.



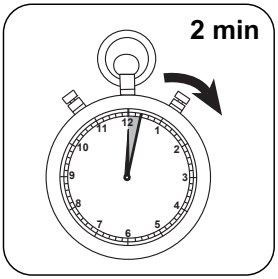
Chiudere la/e cuvetta/e.



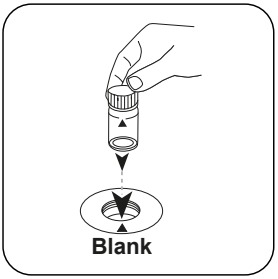
Miscelare il contenuto capovolgendo.



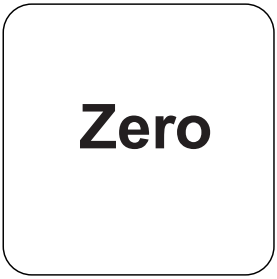
Premere il tasto **ENTER**.



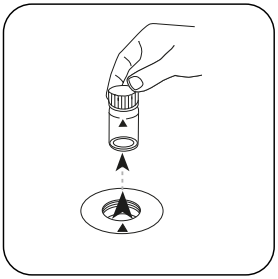
Attendere un **tempo di reazione di 2 minuto/i** .



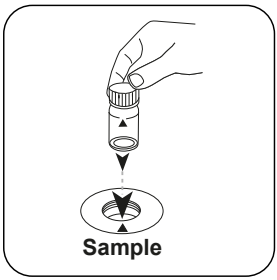
Posizionare la **cuvetta zero** nel vano di misurazione. Fare attenzione al posizionamento.

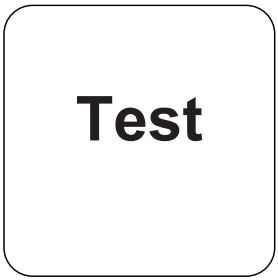


Premere il tasto **ZERO**.



Prelevare la cuvetta dal vano di misurazione.





Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.

Premere il tasto **TEST** (XD: **START**).

Sul display compare il risultato in mg/L di Manganese.

Valutazione

La seguente tabella identifica i valori di output che possono essere convertiti in altre forme di citazione.

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Metodo chimico

PAN

Appendice

Riferimenti bibliografici

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h)]Reagente ausiliario, è utilizzato anche per campioni con durezza superiore a 300 mg / l $CaCO_3$

Manganese HR PP M243

0.1 - 18 mg/L Mn Mn2

Ossidazione con periodato

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
VARIO Manganese HR, set high range F10	1 set	535100

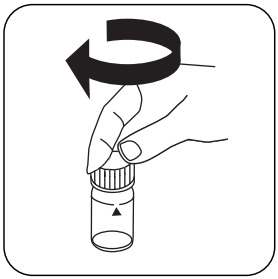
Preparazione

1. I campioni di acqua fortemente tamponati o i campioni di acqua con valori di pH estremi possono superare il potere tamponante dei reagenti e rendono necessaria una regolazione del valore del pH.
   I campioni acidificati per la conservazione devono essere regolati prima dell'analisi su un valore di pH compreso tra 4 e 5 con 5 mol/l (5N) di biossido di sodio. Non superare il valore di pH 5 per evitare precipitazioni di manganese.

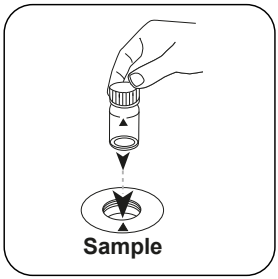
Esecuzione della rilevazione Manganese HR con polvere in bustine Vario

Selezionare il metodo nel dispositivo.

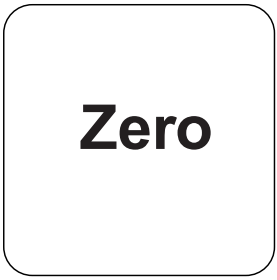
Riempire una cuvetta da 24 mm con **10 mL di campione**.



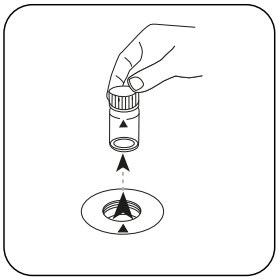
Chiudere la/e cuvetta/e.



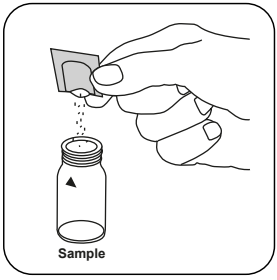
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



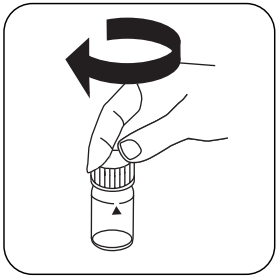
Premere il tasto **ZERO**.



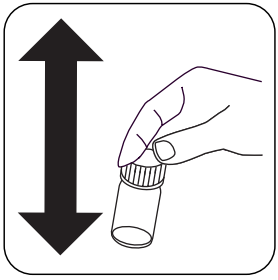
Prelevare la cuvetta dal vano di misurazione.



Aggiungere **una bustina di polvere Vario Manganese Citrate Buffer F10**.

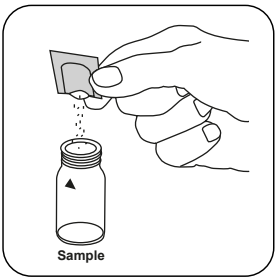


Chiudere la/e cuvetta/e.

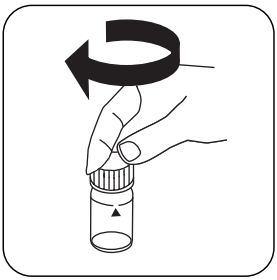


Miscelare il contenuto agitando.

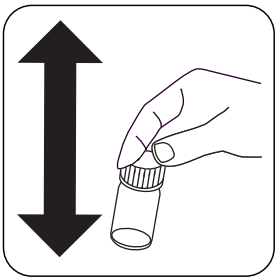
IT



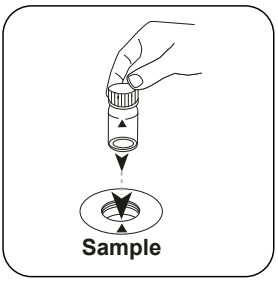
Aggiungere **una bustina di polvere Vario Sodium Periodate F10**.



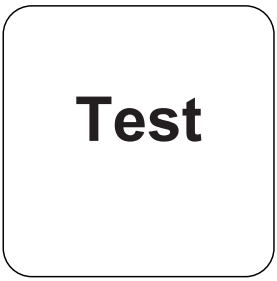
Chiudere la/e cuvetta/e.



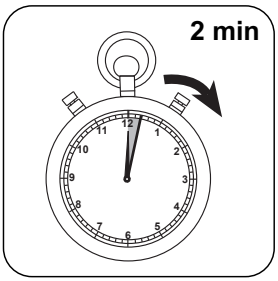
Miscelare il contenuto agitando.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Premere il tasto **TEST** (XD: **START**).



Attendere un **tempo di reazione di 2 minuto/i** .

Allo scadere del tempo di reazione viene effettuata automaticamente la misurazione.

Sul display compare il risultato in mg/L di Manganese.

Valutazione

La seguente tabella identifica i valori di output che possono essere convertiti in altre forme di citazione.

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Metodo chimico

Ossidazione con periodato

Appendice

Interferenze

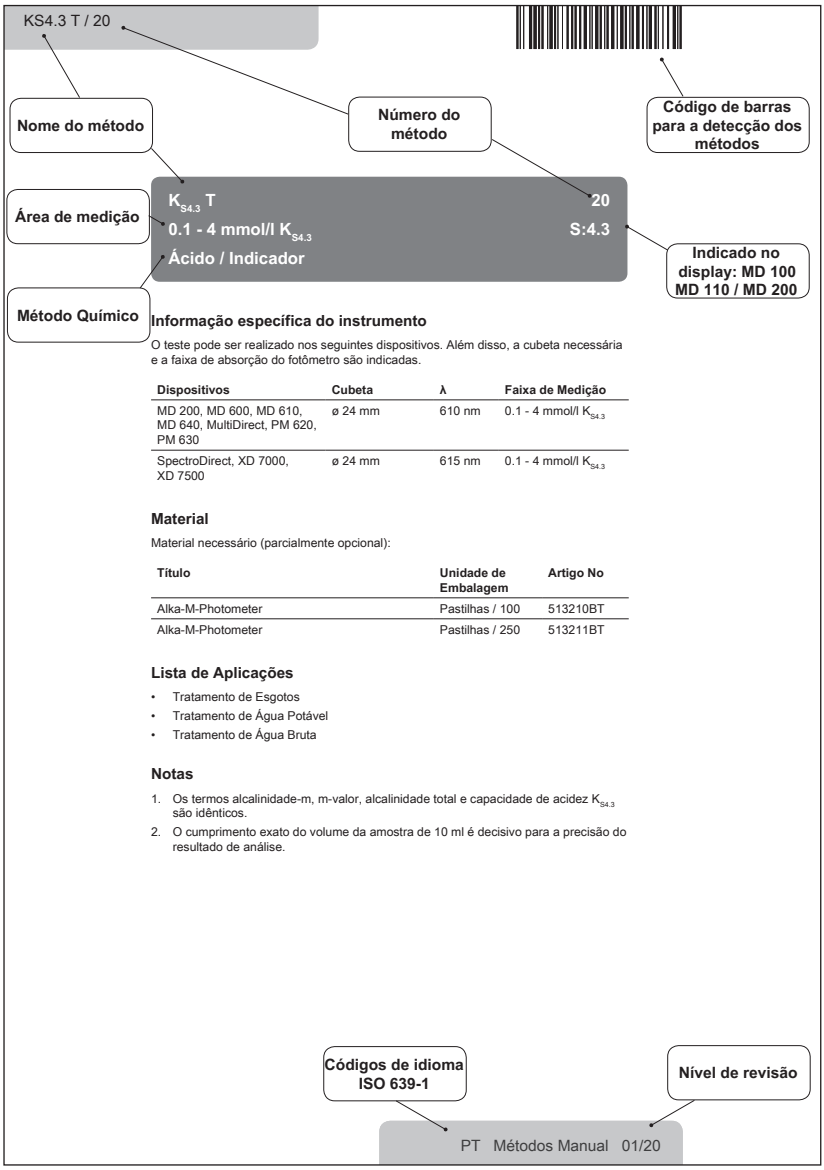
Interferenze	da / [mg/L]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

Validazione metodo

Limite di rilevabilità	0.16 mg/L
Limite di quantificazione	0.49 mg/L
Estremità campo di misura	18 mg/L
Sensibilità	13.02 mg/L / Abs
Intervallo di confidenza	0.28 mg/L
Deviazione standard della procedura	0.12 mg/L
Coefficiente di variazione della procedura	1.29 %

Secondo

40 CFR 136 (US EPA approved HACH)


KS4.3 T / 20
Nome do método
Número do método
Código de barras para a detecção dos métodos
Área de medição
$K_{S4.3}$ T
20
0.1 - 4 mmol/l $K_{S4.3}$
S:4.3
Ácido / Indicador
Indicado no display: MD 100 MD 110 / MD 200
Método Químico
Informação específica do instrumento
O teste pode ser realizado nos seguintes dispositivos. Além disso, a cubeta necessária e a faixa de absorção do fotômetro são indicadas.
Dispositivos | Cubeta | λ | Faixa de Medição
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630 | ø 24 mm | 610 nm | 0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500 | ø 24 mm | 615 nm | 0.1 - 4 mmol/l $K_{S4.3}$
Material
Material necessário (parcialmente opcional):
Título | Unidade de Embalagem | Artigo No
Alka-M-Photometer | Pastilhas / 100 | 513210BT
Alka-M-Photometer | Pastilhas / 250 | 513211BT
Lista de Aplicações
• Tratamento de Esgotos
• Tratamento de Água Potável
• Tratamento de Água Bruta
Notas
1. Os termos alcalinidade-m, m-valor, alcalinidade total e capacidade de acidez $K_{S4.3}$ são idênticos.
2. O cumprimento exato do volume da amostra de 10 ml é decisivo para a precisão do resultado de análise.
Códigos de idioma ISO 639-1
Nível de revisão
PT Métodos Manual 01/20

Efetuar a medição

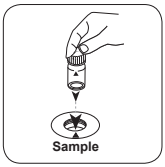
Realização da determinação Capacidade de acidez $K_{S4.3}$ com pastilha

Escolher o método no equipamento.

Para este método não tem de ser efetuada uma medição ZERO nos seguintes equipamentos: XD 7000, XD 7500

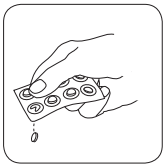
Encher a célula de 24 mm com **10 ml de amostra** .

Fechar a(s) célula(s).

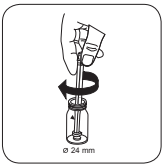


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

• • •



Pastilha ALKA-M-PHOTOMETER.



Esmagar a(s) pastilha(s) rodando ligeiramente.

Fechar a(s) célula(s).

Manganês T M240

0.2 - 4 mg/L Mn Mn

Formaldoxime

PT

Material

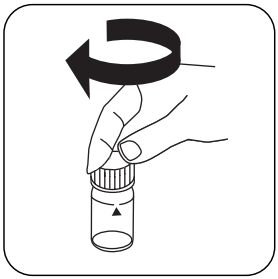
Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
Manganês LR 1	Pastilhas / 100	516080BT
Manganês LR 1	Pastilhas / 250	516081BT
Manganês LR 2	Pastilhas / 100	516090BT
Manganês LR 2	Pastilhas / 250	516091BT
Conjunto Manganês LR 1/LR 2#	cada 100	517621BT
Conjunto Manganês LR 1/LR 2#	cada 250	517622BT

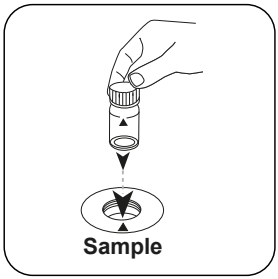
Realização da determinação Manganês com pastilha

Escolher o método no equipamento.

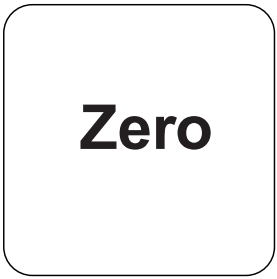
Encher a célula de 24 mm com **10 mL de amostra** .



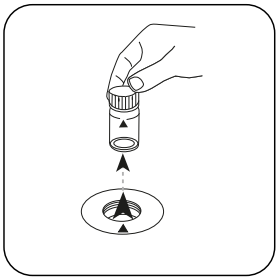
Fechar a(s) célula(s).



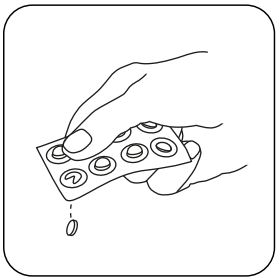
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



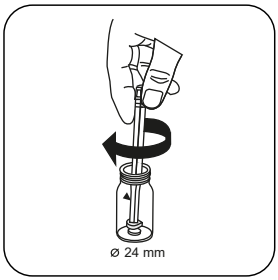
Premir a tecla **ZERO**.



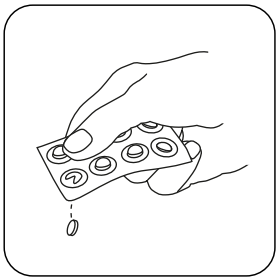
Retirar a célula do compartimento de medição.



Pastilha MANGANESE LR 1.

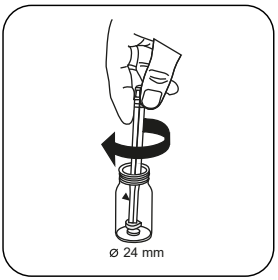


Esmagar a(s) pastilha(s) rodando ligeiramente e dissolver.

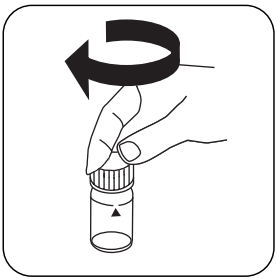


Pastilha MANGANESE LR 2.

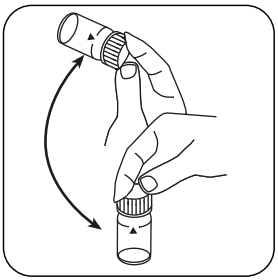
PT



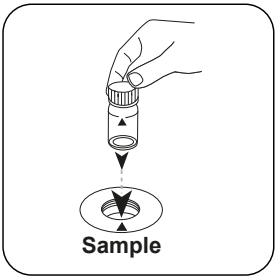
Esmagar a(s) pastilha(s) rodando ligeiramente.



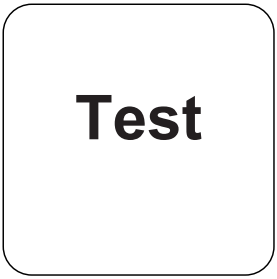
Fechar a(s) célula(s).



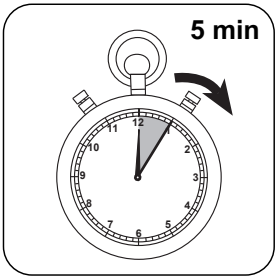
Dissolver a(s) pastilha(s) girando.



Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



Premir a tecla **TEST** (XD: **START**).



Aguardar **5 minuto(s) de tempo de reação**.

Decorrido o tempo de reação, a medição é efetuada automaticamente.

No visor aparece o resultado em mg/L Manganês.

Análises

A tabela a seguir identifica os valores de saída que podem ser convertidos em outras formas de citação.

Unidade	Forma de citação	Fator de conversão
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Método Químico

Formaldoxime

Apêndice

Bibliografia

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

De acordo com

DIN 38406-E2

[#]incluindo vareta de agitação

Manganês LR PP M242

0.01 - 0.7 mg/L Mn Mn1

PAN

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
VARIO Manganês Reagente Set LR 10 ml	1 pc.	535090
Solução de sal VARIO Rochelle, 30 ml [h)]	30 mL	530640

Preparação

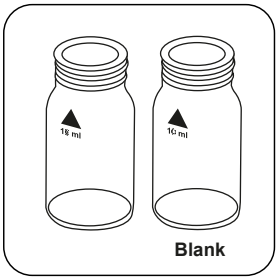
1. Enxaguar todos os vidros para laboratório, antes da análise, com um ácido clorídrico e depois com água desmineralizada.
2. As amostras de água muito tamponadas ou as amostras de água com valores pH extremos podem exceder a capacidade tampão dos reagentes e exigem um ajuste do valor pH.
   Para efeitos de conservação das amostras acidificadas é necessário ajustar, antes da análise, para um valor pH entre 4 e 5 com 5 mol/l (5N) de hidróxido de sódio. Não pode ser excedido um valor pH de 5, pois isso pode causar precipitações de manganês.

Notas

1. Se uma amostra tiver uma dureza superior a 300 mg/L $CaCO_3$, adicionam-se 10 gotas de solução salina Rochelle após a adição do pacote de pó de Ascorbic Acid Vario.
2. Em algumas amostras pode aparecer, depois da adição da solução de reagente "Cianeto alcalino", uma solução nebulosa ou turva. Após a adição da solução de indicador PAN, a turvação devia desaparecer.
3. Se a amostra tiver grandes quantidades de ferro (a partir de 5 mg/L), deve ser cumprido um tempo de reação de 10 minutos.

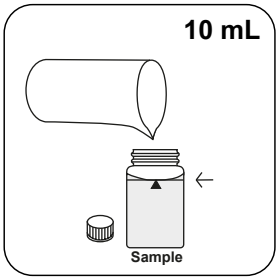
Realização da determinação Manganês LR, com pacote de pó Vario

Escolher o método no equipamento.

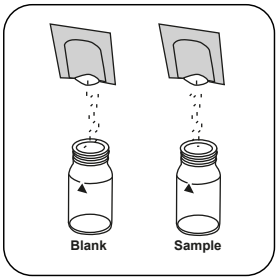


Preparar duas células de 24 mm limpas. Identificar uma célula como célula zero.

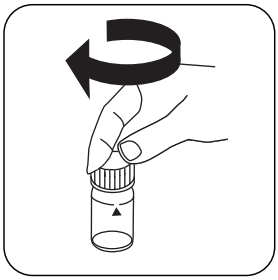
Adicionar **10 mL de água desmineralizada** à célula zero.



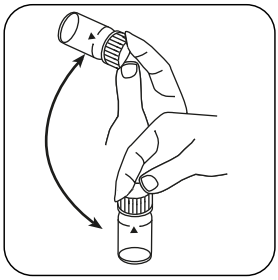
Adicionar **10 mL de amostra** à célula de amostra.



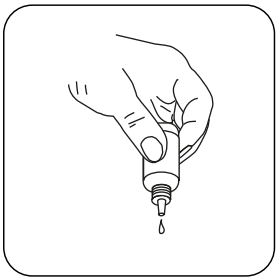
Introduzir em cada célula **um pacote de pó Vario Ascorbic Acid**.



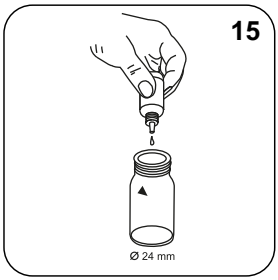
Fechar a(s) célula(s).



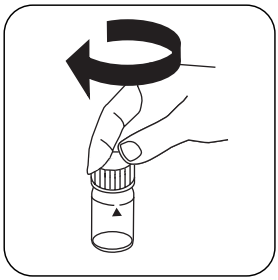
Misturar o conteúdo girando.



Manter os frascos conta gotas na vertical e pressionar lentamente para adicionar gotas de igual dimensão.

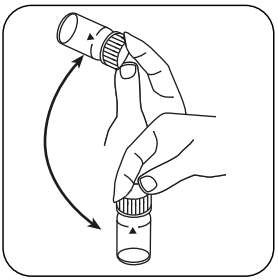


Adicionar **15 gotas Alkaline-Cyanide Reagenz**.

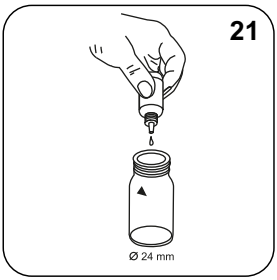


Fechar a(s) célula(s).

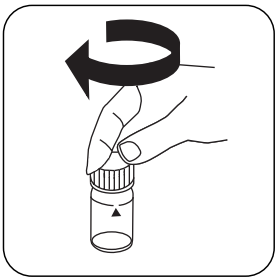
PT



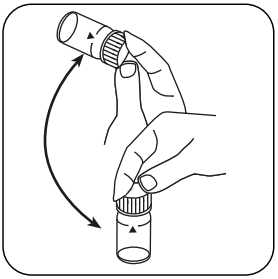
Misturar o conteúdo girando.



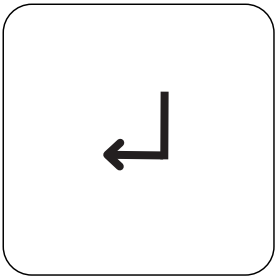
Adicionar **21 gotas PAN Indikator**.



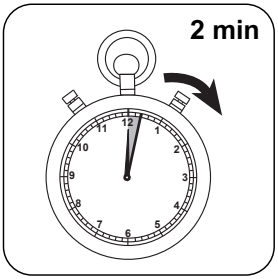
Fechar a(s) célula(s).



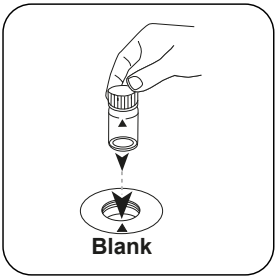
Misturar o conteúdo girando.



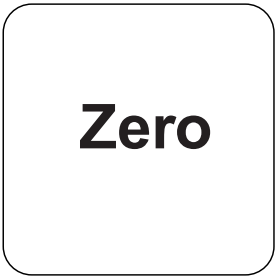
Premir a tecla **ENTER**.



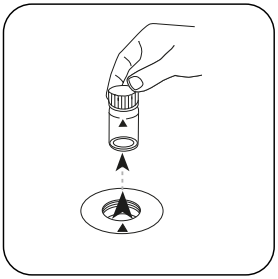
Aguardar **2 minuto(s) de tempo de reação**.



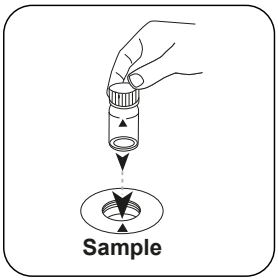
Colocar a **célula zero** no compartimento de medição. Observar o posicionamento.

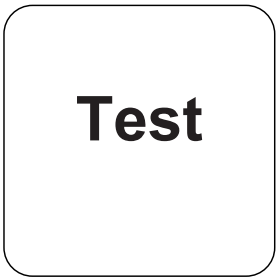


Premir a tecla **ZERO**.



Retirar a célula do compartimento de medição.





Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

Premir a tecla **TEST** (XD: **START**).

No visor aparece o resultado em mg/L Manganês.

Análises

A tabela a seguir identifica os valores de saída que podem ser convertidos em outras formas de citação.

Unidade	Forma de citação	Fator de conversão
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Método Químico

PAN

Apêndice

Bibliografia

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h)]Reagente auxiliar, também é usado para amostras com dureza superior a 300 mg / l $CaCO_3$

Manganês HR PP M243

0.1 - 18 mg/L Mn Mn2

Oxdação de Periodato

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
VARIO Manganeses HR, Defina a high range F10	1 Conjunto	535100

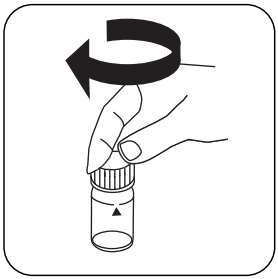
Preparação

1. As amostras de água muito tamponadas ou as amostras de água com valores pH extremos podem exceder a capacidade tampão dos reagentes e exigem um ajuste do valor pH.
   Para efeitos de conservação das amostras acidificadas é necessário ajustar, antes da análise, para um valor pH entre 4 e 5 com 5 mol/l (5N) de hidróxido de sódio. Não pode ser excedido um valor pH de 5, pois isso pode causar precipitações de manganês.

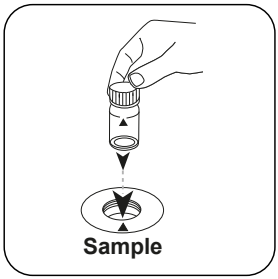
Realização da determinação Manganês HR, com pacote de pó Vario

Escolher o método no equipamento.

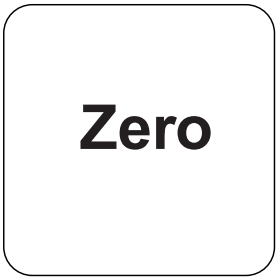
Encher a célula de 24 mm com **10 mL de amostra** .



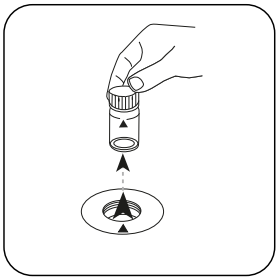
Fechar a(s) célula(s).



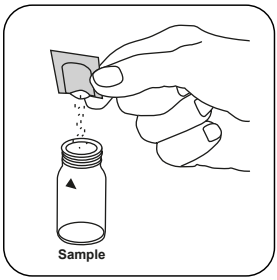
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



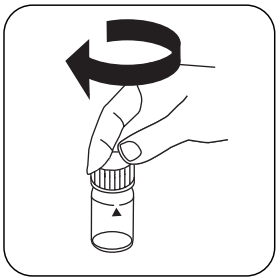
Premir a tecla **ZERO**.



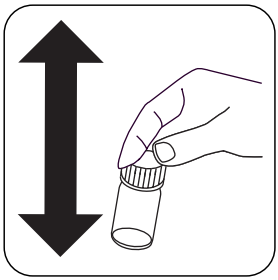
Retirar a célula do compartimento de medição.



Adicionar um **pacote de pó Vario Manganese Citrate Buffer F10** .

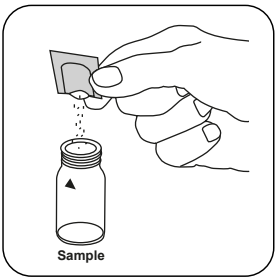


Fechar a(s) célula(s).

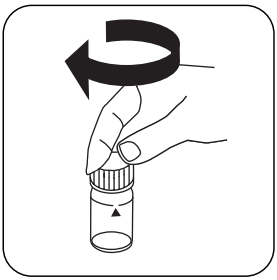


Misturar o conteúdo agitando.

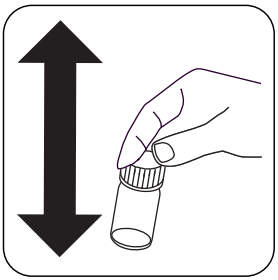
PT



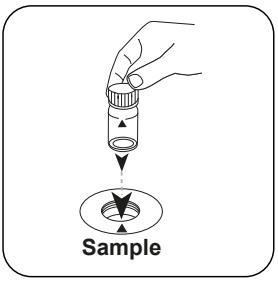
Adicionar um **pacote de pó Vario Sodium Periodate F10** .



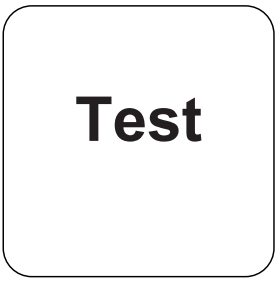
Fechar a(s) célula(s).



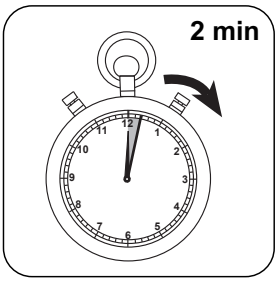
Misturar o conteúdo agitando.



Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



Premir a tecla **TEST** (XD: **START**).



Aguardar **2 minuto(s) de tempo de reação**.

Decorrido o tempo de reação, a medição é efetuada automaticamente.

No visor aparece o resultado em mg/L Manganês.

Análises

A tabela a seguir identifica os valores de saída que podem ser convertidos em outras formas de citação.

Unidade	Forma de citação	Fator de conversão
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Método Químico

Oxdação de Periodato

Apêndice

Texto de Interferências

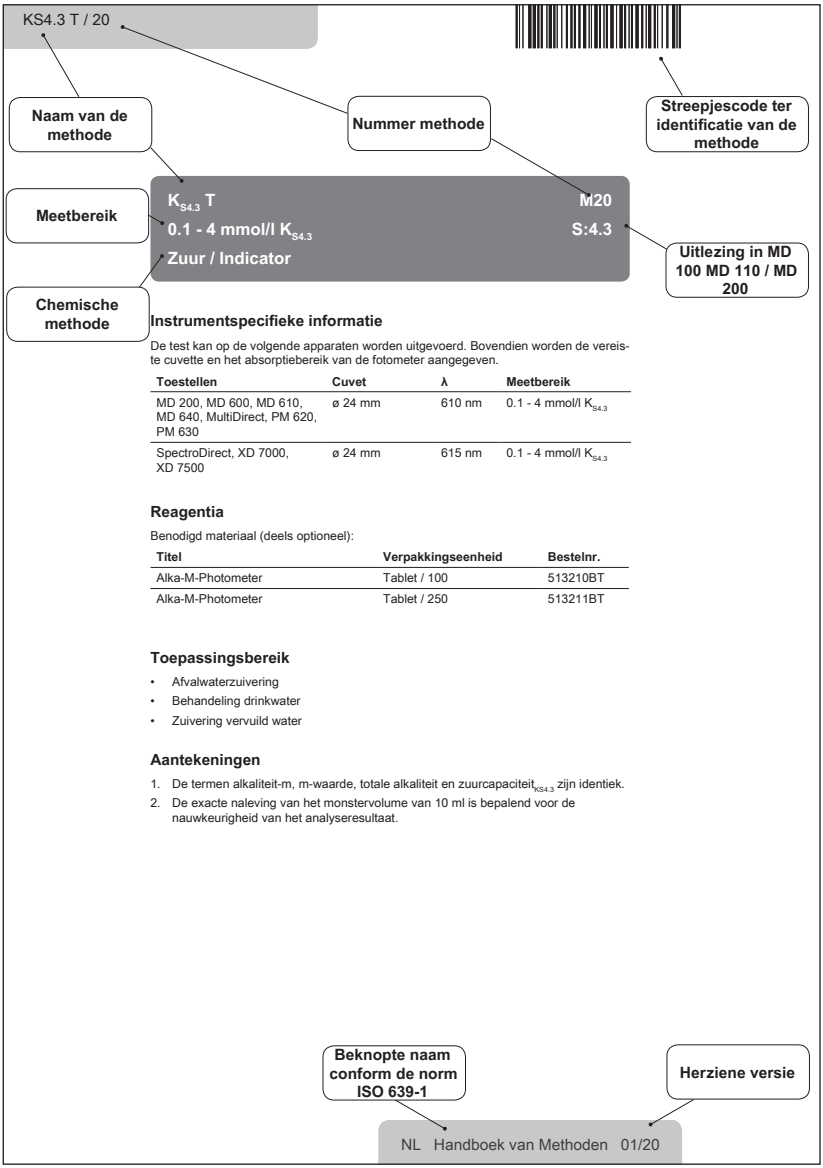
Interferências	a partir de / [mg/L]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

Validação de método

Limite de Detecção	0.16 mg/L
Limite de Determinação	0.49 mg/L
Fim da Faixa de Medição	18 mg/L
Sensibilidade	13.02 mg/L / Abs
Faixa de Confiança	0.28 mg/L
Desvio Padrão	0.12 mg/L
Coeficiente de Variação	1.29 %

De acordo com

40 CFR 136 (US EPA approved HACH)


KS4.3 T / 20
Naam van de methode
Nummer methode
Streepjescode ter identificatie van de methode
Meetbereik
Chemische methode
Uitlezing in MD 100 MD 110 / MD 200
K S4.3 T
M20
0.1 - 4 mmol/l K S4.3
S:4.3
Zuur / Indicator
Instrumentspecifieke informatie
De test kan op de volgende apparaten worden uitgevoerd. Bovendien worden de vereiste cuvette en het absorptiebereik van de fotometer aangegeven.
Toestellen
Cuvet
λ
Meetbereik
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630
ø 24 mm
610 nm
0.1 - 4 mmol/l K S4.3
SpectroDirect, XD 7000, XD 7500
ø 24 mm
615 nm
0.1 - 4 mmol/l K S4.3
Reagentia
Benodigd materiaal (deels optioneel):
Titel
Verpakkingseenheid
Bestelnr.
Alka-M-Photometer
Tablet / 100
513210BT
Alka-M-Photometer
Tablet / 250
513211BT
Toepassingsbereik
• Afvalwaterzuivering
• Behandeling drinkwater
• Zuivering vervuild water
Aantekeningen
1. De termen alkaliteit-m, m-waarde, totale alkaliteit en zuurcapaciteit KS4.3 zijn identiek.
2. De exacte naleving van het monstervolume van 10 ml is bepalend voor de nauwkeurigheid van het analyseresultaat.
Beknopte naam conform de norm ISO 639-1
Herziene versie
NL Handboek van Methoden 01/20

Uitvoering van de meting

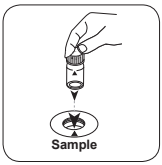
Uitvoering van de bepaling Zuurcapaciteit $K_{S4.3}$ met tablet

De methode in het apparaat selecteren.

Voor deze methode moet bij de volgende apparaten geen nulmeting worden uitgevoerd: XD 7000, XD 7500

Spoelbakje van 24 mm met **10 ml staal** vullen.

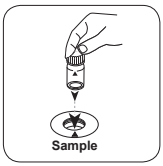
De spoelbakjes afsluiten.



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

• • •

Tabletten oplossen door om te draaien



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

De toets **TEST** (XD: **START**) indrukken.

De display toont het resultaat als Zuurcapaciteit $K_{S4.3}$.

Mangaan T **M240**

0.2 - 4 mg/L Mn **Mn**

Formaldehyde

NL

Reagentia

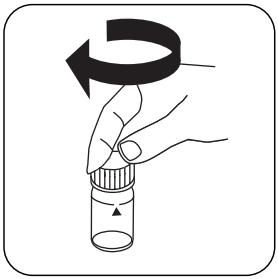
Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
Mangaan LR 1	Tablet / 100	516080BT
Mangaan LR 1	Tablet / 250	516081BT
Mangaan LR 2	Tablet / 100	516090BT
Mangaan LR 2	Tablet / 250	516091BT
Set mangaan LR 1/LR 2#	per 100	517621BT
Set mangaan LR 1/LR 2#	per 250	517622BT

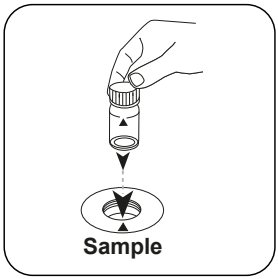
Uitvoering van de bepaling Mangaan met tablet

De methode in het apparaat selecteren.

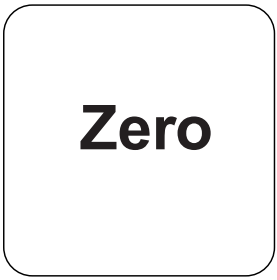
Spoelbakje van 24 mm met **10 mL staal** vullen.



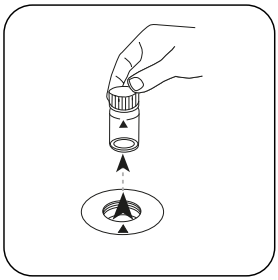
De spoelbakjes afsluiten.



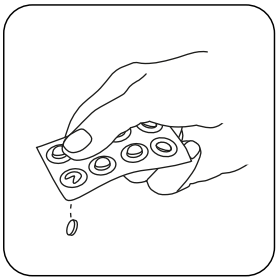
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



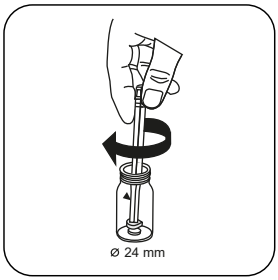
De toets **NUL** indrukken.



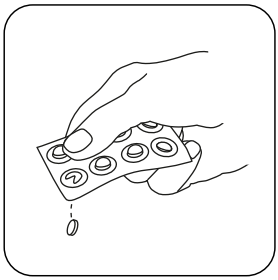
Het spoelbakje uit de meetschacht nemen.



Een MANGANESE LR 1 tablet toevoegen.

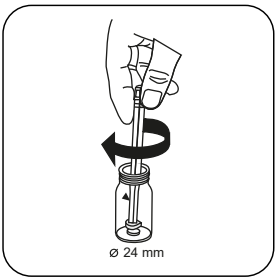


De tabletten onder lichte rotatie verpletteren en oplossen.

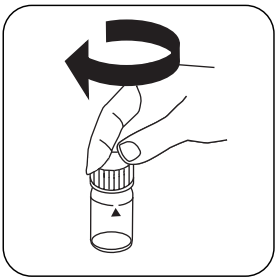


Een MANGANESE LR 2 tablet toevoegen.

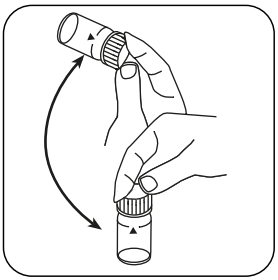
NL



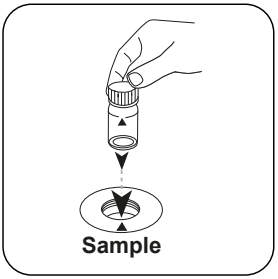
De tabletten onder lichte rotatie verpletteren.



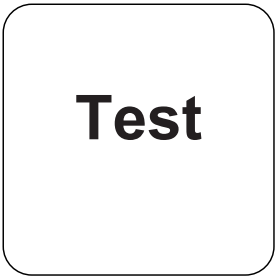
De spoelbakjes afsluiten.



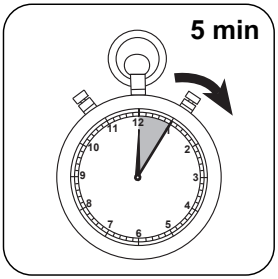
Tabletten oplossen door om te draaien



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **TEST** (XD: **START**) indrukken.



De reactietijd van 5 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Mangaan.

Evaluatie

De volgende tabel geeft aan dat de uitvoerwaarden kunnen worden geconverteerd naar andere citatievormen.

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemische methode

Formaldehyde

Aanhangsel

Literatuurverwijzing

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

Overeenkomstig

DIN 38406-E2

met inbegrip van de mengstaaf

Mangaan LR PP M242

0.01 - 0.7 mg/L Mn Mn1

PAN

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
VARIO mangaan reagens set LR 10 ml	1 St.	535090
VARIO Rochelle zoutoplossing, 30 ml [h)]	30 mL	530640

Voorbereiding

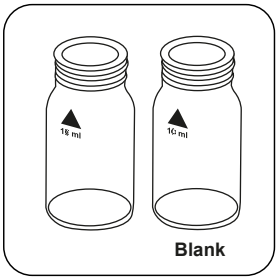
1. Spoel alle laboratoriumglazen voor de analyse met verdund salpeterzuur en vervolgens met gedeïoniseerd water.
2. Hoog gebufferde watermonsters of watermonsters met extreme pH-waarden kunnen de buffercapaciteit van de reagentia overschrijden en moeten de pH-waarde worden aangepast.
   De pH van de aangezuurde monsters moet vóór de analyse worden ingesteld op een pH tussen 4 en 5 met 5 mol/l (5N) natriumhydroxide. Een pH-waarde van 5 mag niet worden overschreden, anders kan er mangaanneerslag optreden.

Aantekeningen

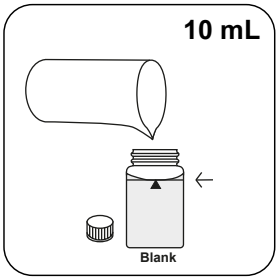
1. Als een monster meer dan 300 mg/L $CaCO_3$ hardheid bevat, worden 10 druppels Rochelle zoutoplossing toegevoegd na toevoeging van de Vario Ascorbinezuur-poederverpakking.
2. In sommige monsters kan na toevoeging van de reagensoplossing "alkaline-cyanide" een troebele oplossing ontstaan. Na toevoeging van de PAN-indicatoroplossing zou de troebelheid moeten verdwijnen.
3. Als het monster grote hoeveelheden ijzer bevat (vanaf 5 mg/L), moet een reactietijd van 10 minuten in acht worden genomen.

Uitvoering van de bepaling Mangaan LR, met Vario-poederpakje

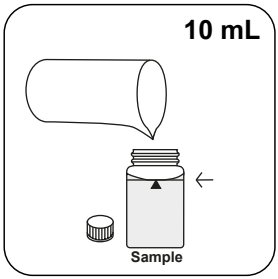
De methode in het apparaat selecteren.



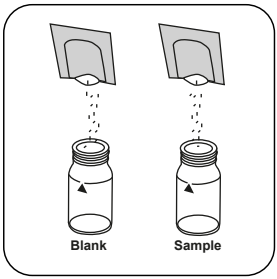
Twee propere spoelbakjes van 24 mm klaarzetten. Een als nulspoelbakje kenmerken.



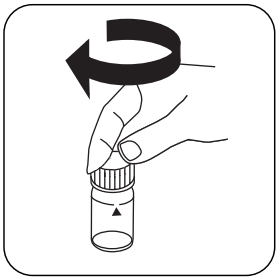
10 mL gedeïoniseerd water in het nulspoelbakje doen.



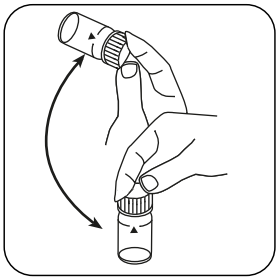
10 mL staal in het staalspoelbakje doen.



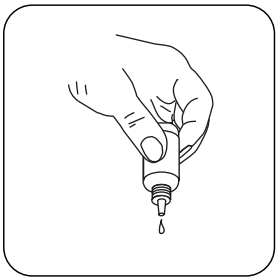
In elk spoelbakje **een Vario Ascorbic Acid poederpakje** doen.



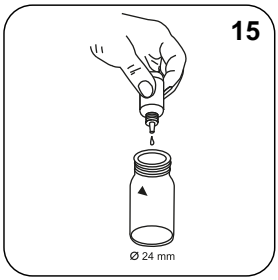
De spoelbakjes afsluiten.



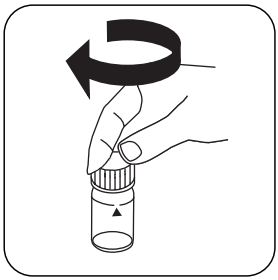
De inhoud mengen door om te draaien.



De druppelflessen verticaal houden en even grote druppels toevoegen door langzaam te drukken.

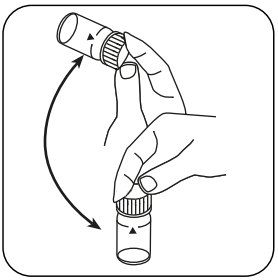


15 druppels Alkaline-Cyanide reagens toevoegen.

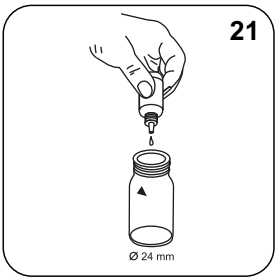


De spoelbakjes afsluiten.

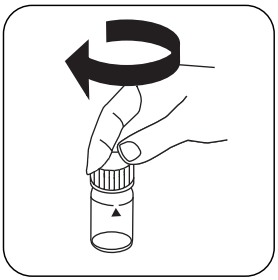
NL



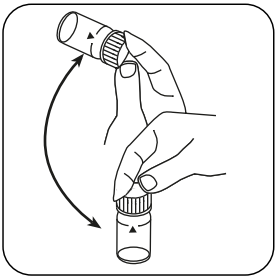
De inhoud mengen door om te draaien.



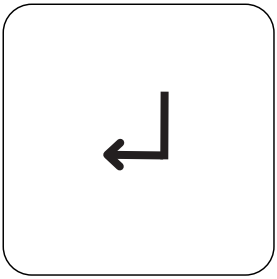
21 druppels PAN-indicator toevoegen.



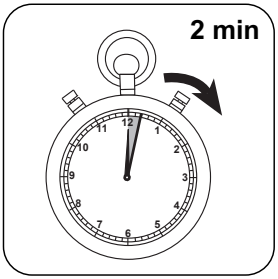
De spoelbakjes afsluiten.



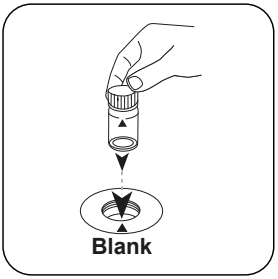
De inhoud mengen door om te draaien.



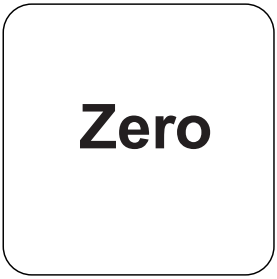
De toets **ENTER** indrukken.



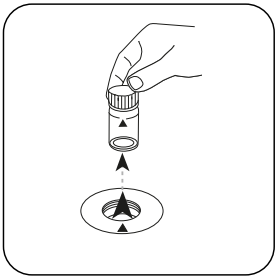
De reactietijd van 2 minuten afwachten.



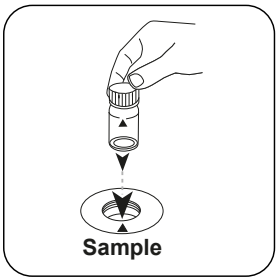
Het **nulspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

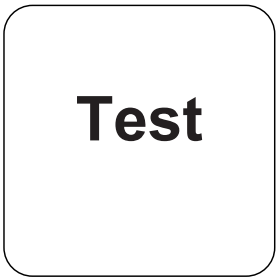


De toets **NUL** indrukken.



Het spoelbakje uit de meetschacht nemen.





Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

De toets **TEST** (XD: **START**) indrukken.

De display toont het resultaat in mg/L Mangaan.

Evaluatie

De volgende tabel geeft aan dat de uitvoerwaarden kunnen worden geconverteerd naar andere citatievormen.

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

NL

Chemische methode

PAN

Aanhangsel

Literatuurverwijzing

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h)] hulpreagens, extra gebruikt voor monsters met een hardheid van meer dan 300 mg/l $CaCO_3$

Mangaan HR PP M243

0.1 - 18 mg/L Mn Mn2

Periodaatoxidatie

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
VARIO Mangaan HR, set hoog bereik F10	1 Zin	535100

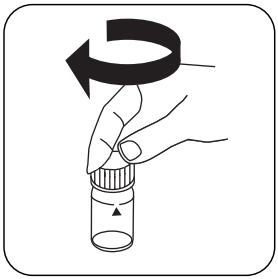
Voorbereiding

1. Hoog gebufferde watermonsters of watermonsters met extreme pH-waarden kunnen de buffercapaciteit van de reagentia overschrijden en moeten de pH-waarde worden aangepast.
   De pH van de aangezuurde monsters moet vóór de analyse worden ingesteld op een pH tussen 4 en 5 met 5 mol/l (5N) natriumhydroxide. Een pH-waarde van 5 mag niet worden overschreden, anders kan er mangaanneerslag optreden.

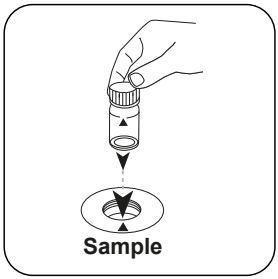
Uitvoering van de bepaling Mangaan HR, met Vario-poederpakje

De methode in het apparaat selecteren.

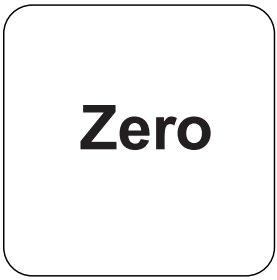
Spoelbakje van 24 mm met **10 mL staal** vullen.



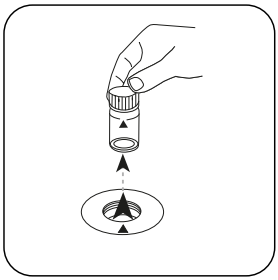
De spoelbakjes afsluiten.



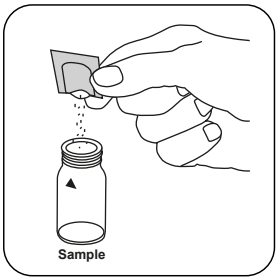
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



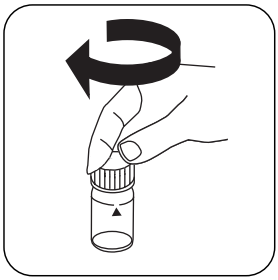
De toets **NUL** indrukken.



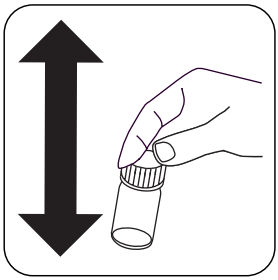
Het spoelbakje uit de meetschacht nemen.



Een **Vario Manganese Citrate Buffer F10 poederpakje** toevoegen.

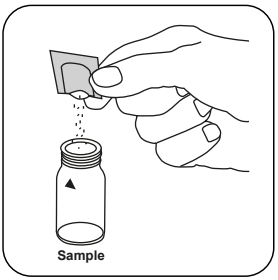


De spoelbakjes afsluiten.

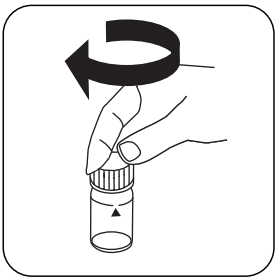


De inhoud mengen door te schudden.

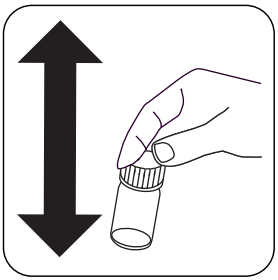
NL



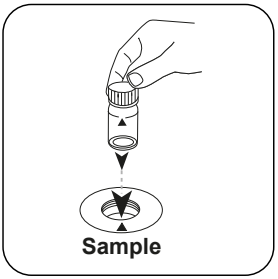
Een **Vario Sodium Periodate F10 poederpakje** toevoegen.



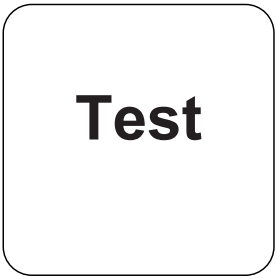
De spoelbakjes afsluiten.



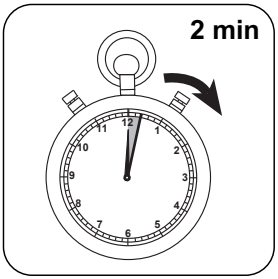
De inhoud mengen door te schudden.



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **TEST** (XD: **START**) indrukken.



De reactietijd van 2 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Mangaan.

Evaluatie

De volgende tabel geeft aan dat de uitvoerwaarden kunnen worden geconverteerd naar andere citatievormen.

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemische methode

Periodaatoxidatie

Aanhangsel

Verstoringen

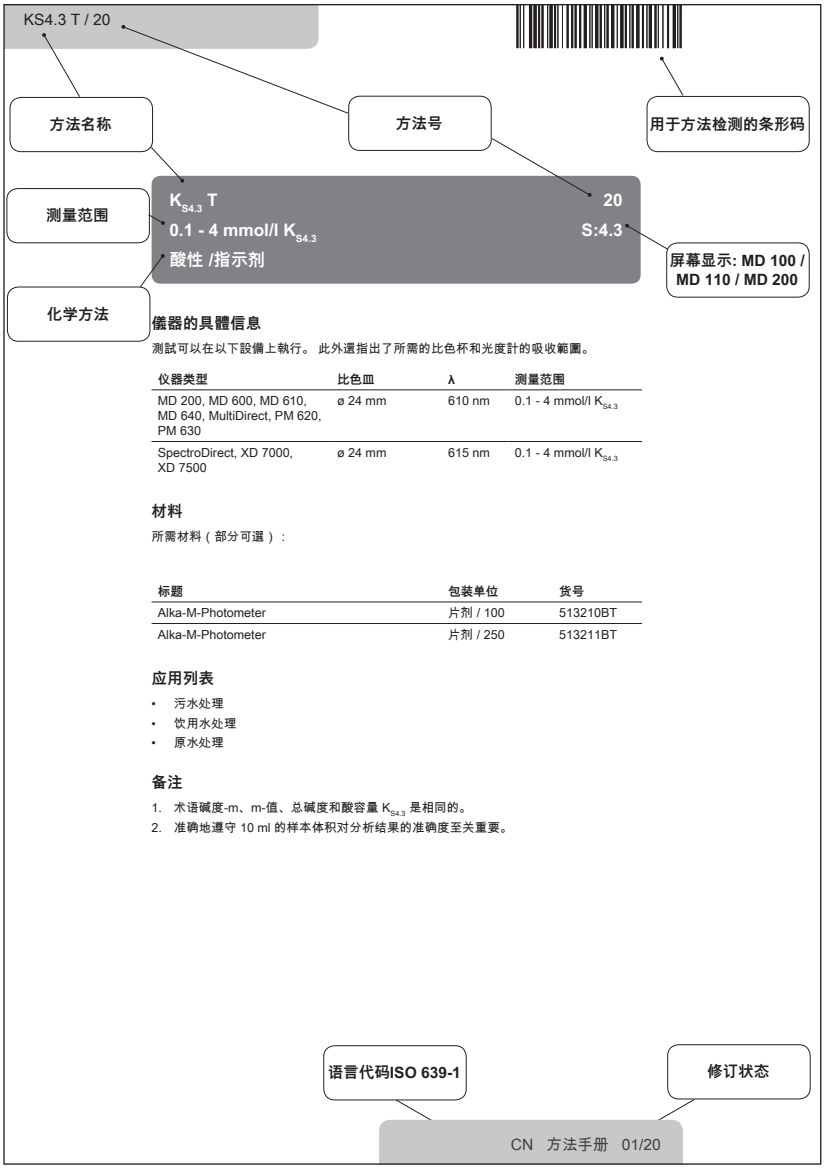
Verstoringen	verstoort vanaf
Ca	700
Cl^-	70000
Fe	5
Mg	100000

Validatie van de methodes

Aantoonbaarheidsgrens	0.16 mg/L
Bepaalbaarheidsgrens	0.49 mg/L
Einde meetbereik	18 mg/L
Gevoeligheid	13.02 mg/L / Abs
Betrouwbaarheidsgrenzen	0.28 mg/L
Standaardafwijking procedure	0.12 mg/L
Variatiecoefficient procedure	1.29 %

Overeenkomstig

40 CFR 136 (goedgekeurd door het Amerikaanse EPA HACH)



儀器的具體信息

測試可以在以下設備上執行。 此外還指出了所需的比色杯和光度計的吸收範圍。

仪器类型	比色皿	λ	测量范围
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

材料

所需材料（部分可選）：

标题	包装单位	货号
Alka-M-Photometer	片剂 / 100	513210BT
Alka-M-Photometer	片剂 / 250	513211BT

应用列表

- 污水处理
- 饮用水处理
- 原水处理

备注

1. 术语碱度-m、m-值、总碱度和酸容量 $K_{S4.3}$ 是相同的。
2. 准确地遵守 10 ml 的样本体积对分析结果的准确度至关重要。

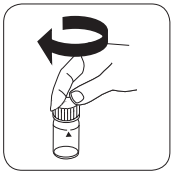
开始测量

进行测定 $K_{S4.3}$ 片剂酸容量

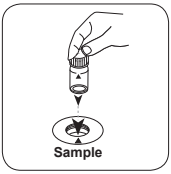
选择设备中的方法。

对于这种方法，在以下设备上不能进行 ZERO 测量：XD 7000, XD 7500

用 **10 ml** 样本填充 24 mm 比色杯。

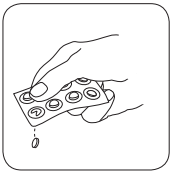


密封比色杯。

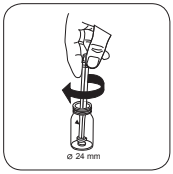


将样本比色杯放入测量轴中。注意定位。

• • •



加入 **ALKA-M-PHOTOMETER** 片剂。



用轻微的扭转压碎片剂。

密封比色杯。

CN 方法手册 01/20

T 锰 M240

0.2 - 4 mg/L Mn Mn

甲醛肟

材料
所需材料（部分可選）：

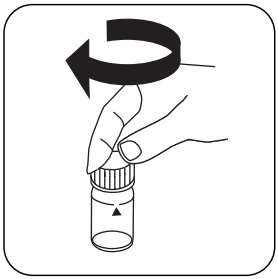
ZH

试剂	包装单位	货号
锰 LR 1	片剂 / 100	516080BT
锰 LR 1	片剂 / 250	516081BT
锰 LR 2	片剂 / 100	516090BT
锰 LR 2	片剂 / 250	516091BT
套件锰 LR 1/LR 2#	各100次	517621BT
套件锰 LR 1/LR 2#	各250次	517622BT

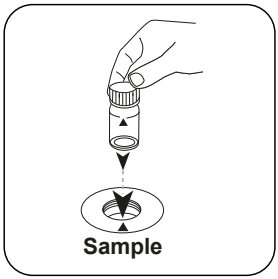
进行测定 锰片剂

选择设备中的方法。

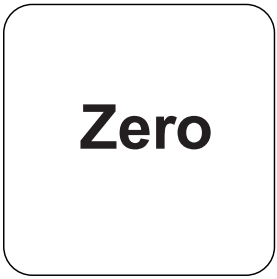
用 **10 mL 样本**填充 24 mm 比色杯。



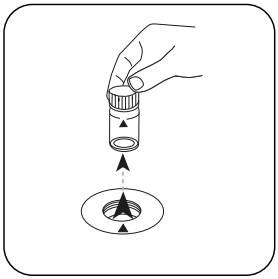
密封比色杯。



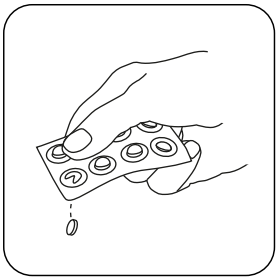
将**样本比色杯**放入测量轴中。注意定位。



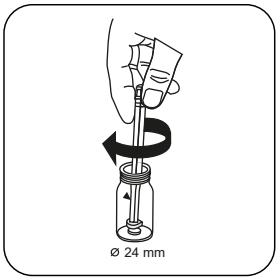
按下 **ZERO** 按钮。



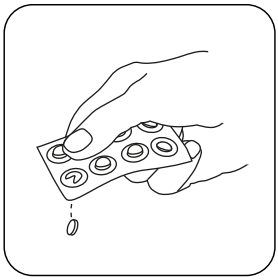
从测量轴上取下比色杯。



加入 **MANGANESE LR 1 片剂** 。

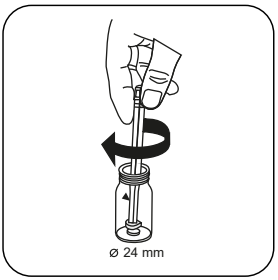


用轻微的扭转压碎片剂并溶解。

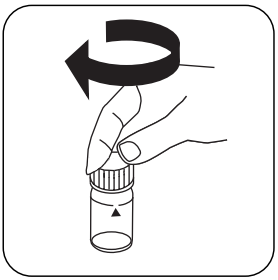


加入 **MANGANESE LR 2 片剂** 。

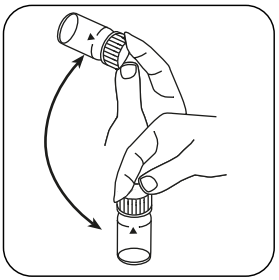
ZH



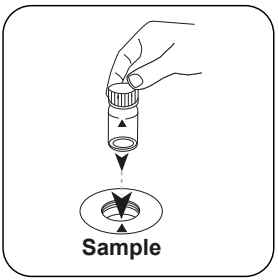
用轻微的扭转压碎片剂。



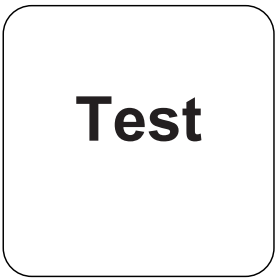
密封比色杯。



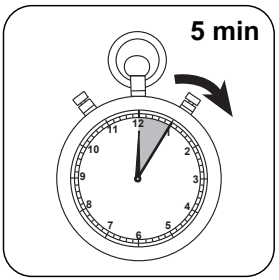
通过旋转溶解片剂。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。



等待 **5 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 mg / l 锰。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

化学方法

甲醛肟

附錄

参考文献

Gottlieb, A. & Hecht, F. Mikrochim Acta (1950) 35: 337

参照

DIN 38406-E2

i含搅拌棒, 10cm

LR PP 锰 M242

0.01 - 0.7 mg/L Mn Mn1

PAN

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
VARIO 锰试剂套件 LR 10 ml	1 片	535090
VARIO Rochelle 盐溶液, 30 ml [h)]	30 mL	530640

准备

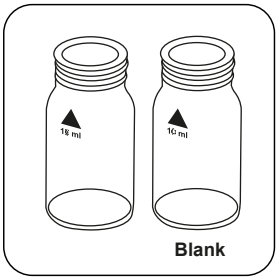
1. 在分析前用稀硝酸冲洗所有的实验室玻璃器皿，然后用去离子水冲洗。
2. 高度缓冲水样或极端 pH 值水样可能超过试剂的缓冲能力，需要调整 pH 值。在分析前必须使用 5 mol/L（5N）氢氧化钠将酸化保存的样本调节至 pH 4 至 5 之间。pH 值不得超过 5，否则会导致锰沉淀。

备注

1. 如果样本含有超过 300 mg/L $CaCO_3$ 硬度，加入 Vario 抗坏血酸粉包后加入 10 滴 Rochelle 盐溶液。
2. 对于某些样本，加入试剂溶液“碱性氰化物”可能会导致絮状或浑浊的溶液。加入 PAN 指示剂溶液后浑浊应消失。
3. 如果样本含有大量的铁（从 5 mg/L 起），必须保持 10 分钟的反应时间。

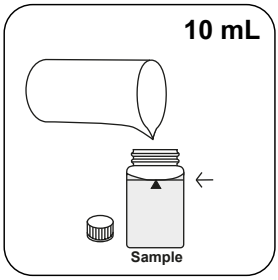
进行测定 LR 锰 Vario 粉包

选择设备中的方法。

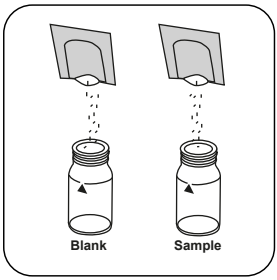


准备两个干净的 24 mm 比色杯。将一个比色杯标记为空白比色杯。

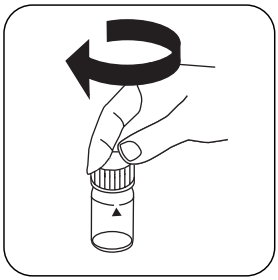
加入 **10 mL 去离子水**到比色杯中。



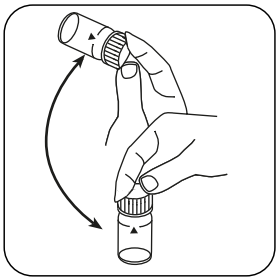
加入 **10 mL 样本**到样本比色杯中。



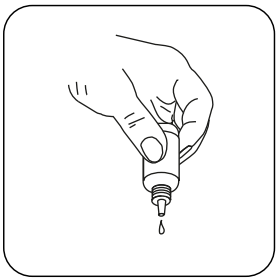
在每个比色杯中加入一个 **Vario Ascorbic Acid 粉包**。



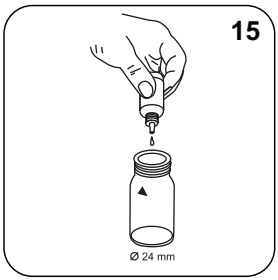
密封比色杯。



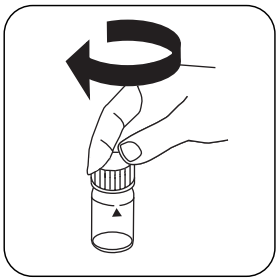
通过旋转混合内容物。



垂直握住滴瓶，慢慢加入相同大小的滴剂。

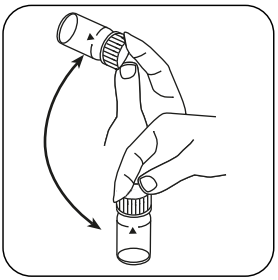


加入 **15 滴 Alkaline-Cyanide Reagenz**。

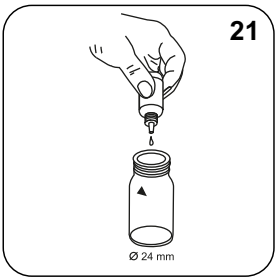


密封比色杯。

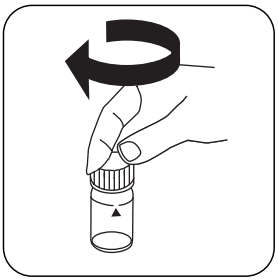
ZH



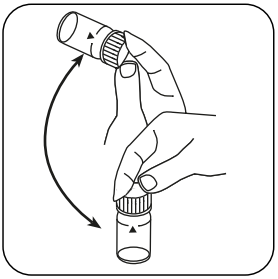
通过旋转混合内容物。



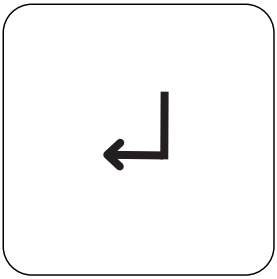
加入 **21 滴 PAN Indikator**。



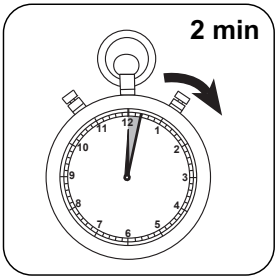
密封比色杯。



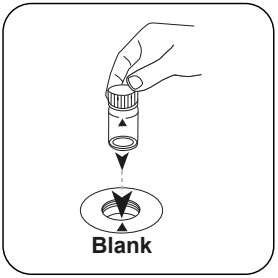
通过旋转混合内容物。



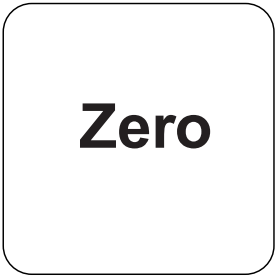
按下 **ENTER** 按钮。



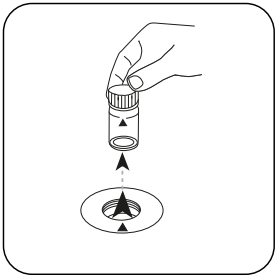
等待 **2 分钟反应时间** 。



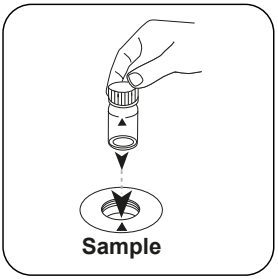
将**空白比色杯**放入测量轴中。注意定位。



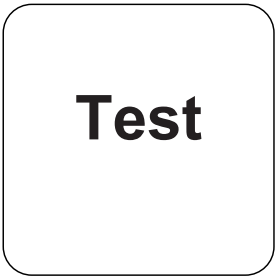
按下 **ZERO** 按钮。



从测量轴上取下比色杯。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。

结果在显示屏上显示为 mg / l 锰。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

化学方法

PAN

附錄

参考文献

Goto, K., et al., Talanta, 24, 652-3 (1977)

[h] 附加试剂，用于硬度值高于的300 mg/l $CaCO_3$分析

HR PP 锰 M243

0.1 - 18 mg/L Mn Mn2

高碘酸氧化

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
VARIO 锰 HR，套件高量程 F10	1 组	535100

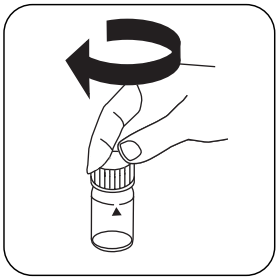
准备

1. 高度缓冲水样或极端 pH 值水样可能超过试剂的缓冲能力，需要调整 pH 值。
   在分析前必须使用 5 mol/L（5N）氢氧化钠将酸化保存的样本调节至 pH 4 至 5 之间。pH 值不得超过 5，否则会导致锰沉淀。

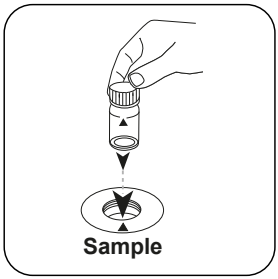
进行测定 HR 锰 Vario 粉包

选择设备中的方法。

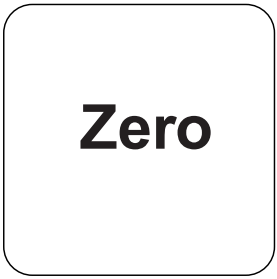
用 **10 mL 样本**填充 24 mm 比色杯。



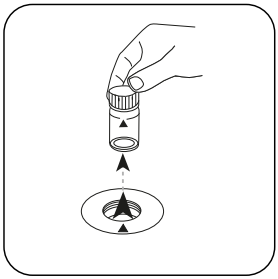
密封比色杯。



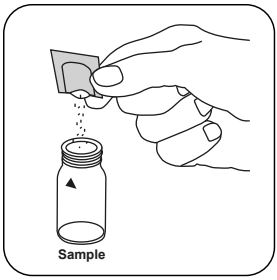
将**样本比色杯**放入测量轴中。注意定位。



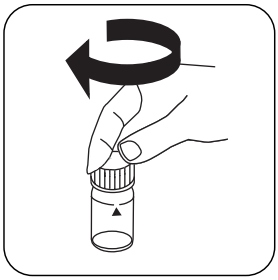
按下 **ZERO** 按钮。



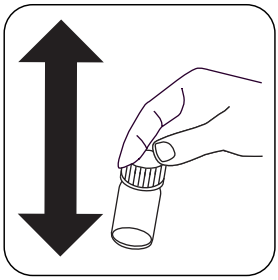
从测量轴上取下比色杯。



加入 **Vario Manganese Citrate Buffer F10 粉包** 。

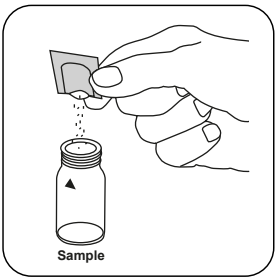


密封比色杯。

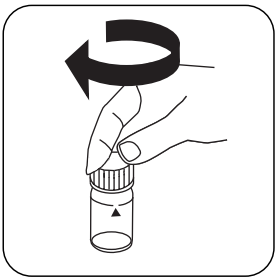


通过摇晃混合内容物。

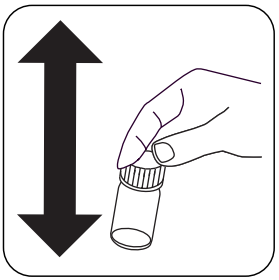
ZH



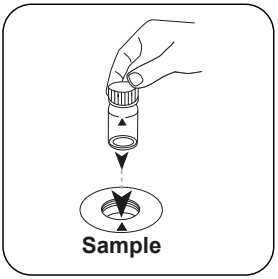
加入 **Vario Sodium Periodate F10 粉包** 。



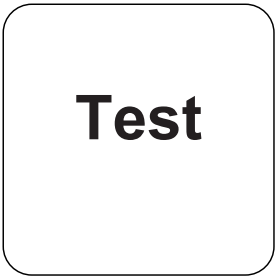
密封比色杯。



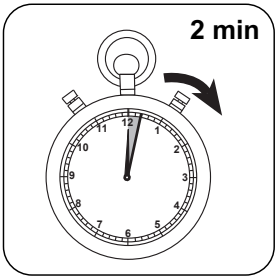
通过摇晃混合内容物。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。



等待 **2 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 mg / l 锰。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

化学方法

高碘酸氧化

附錄

干扰说明

干擾	從/ [mg/l]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

方法验证

检出限	0.16 mg/L
测定下限	0.49 mg/L
测量上限	18 mg/L
灵敏度	13.02 mg/L / Abs
置信范围	0.28 mg/L
标准偏差	0.12 mg/L
变异系数	1.29 %

参照

40 CFR 136 (US EPA approved HACH)

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