Total Hardness Test Kit

1 to 20 mg/L and 1 to 20 gpg (17 to 342 mg/L) as $CaCO_3$

For test kit 145201 (HA-71A) DOC326.98.00002

Additional copies available on www.hach.com

Test preparation

- Rinse labware with deionized water between tests.
- When titrating, count each drop of titrant. Hold the dropper vertically. Swirl after each drop is added.

CAUTION: Handle chemical standards and reagents carefully. Review Material Safety Data Sheets for safe handling, storage and disposal information.

Required items

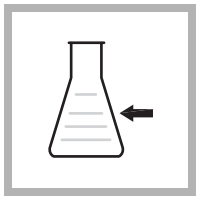
Description	Unit	Catalog no.
Bottle, square mixing	6/pkg	43906
Flask, Erlenmeyer, 125-mL	each	50543
Hardness 1 Buffer Solution	100 mL MDB[1]	42432
Hardness 2, ManVer® 2 hardness indicator	100 mL MDB[1]	42532
Hardness 3 Titrant Reagent	100 mL MDB[1]	42632
Measuring Tube, plastic, 5.83 mL	each	43800

[1] Marked dropping bottle

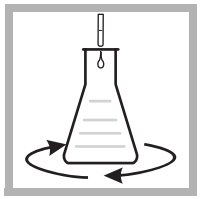
Optional items

Description	Unit	Catalog no.
Deionized Water	500 mL	27249
Hardness Standard Solution, 20 gpg as $CaCO_3$	500 mL	47949

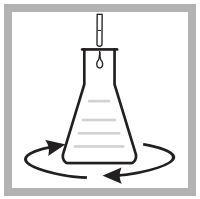
Low range (1 to 20 mg/L) test procedure



1. Fill the flask to the 100-mL mark with sample.

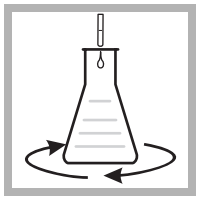


2. Add 2 mL of Buffer Solution, Hardness 1 to the flask. Swirl to mix.



3. Add four drops of Hardness 2 Indicator. Swirl to mix.

A blue color indicates soft water. If a red color develops, proceed to step 4.



4. Add Hardness 3 Titrant Reagent by drops. Count the drops until the color changes from red to blue. Swirl to mix after each drop.

5. Calculate the results. Each drop of Hardness 3 Titrant Reagent equals 1 mg/L as calcium carbonate ($CaCO_3$).

High range (1 to 20 gpg (17 to 342 mg/L)) test procedure

1. Fill the plastic measuring tube to the top with sample.

Pour the sample into the bottle.

2. Add three drops of Buffer Solution, Hardness 1 to the mixing bottle. Swirl to mix.

3. Add one drop of Hardness 2 Indicator to the mixing bottle. Swirl to mix.

A blue color indicates soft water. If a red color develops, proceed to step 4.

4. Add Hardness 3 Titrant Reagent by drops. Count the drops until the color changes from red to blue. Swirl to mix after each drop.

5. Calculate the results. Each drop of Hardness 3 Titrant Reagent equals 1 grain per gallon hardness as calcium carbonate ($CaCO_3$). One grain per gallon (gpg) equals 17.1 mg/L.

For technical assistance or ordering information: visit www.hach.com, call 800-227-4224 or email techhelp@hach.com Edition 1, August 2006

总硬度测试工具包

1 至 20 mg/L 和 1 至 20 gpg（17 至 342 mg/L），以 $CaCO_3$ 折算

适用于测试工具包 145201 (HA-71A) DOC326.98.00002

www.hach.com 上提供的其他副本

测试准备

- 在进行新的测试之前使用去离子水清洗实验室器具。
- 滴定时，对每一滴滴定剂都要计数。垂直握住滴管。每加一滴都要摇匀。

警告：处理化学标准溶液和试剂时要小心。有关安全处理、存储和处置的信息，请查阅材料安全数据表。

必需项目

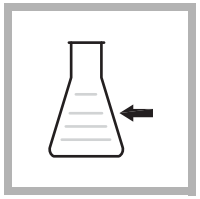
说明	单位	货号
方形混合瓶	6/pkg	43906
125-mL 锥形烧瓶	个	50543
硬度为 1 的缓冲溶液	100 mL MDB[1]	42432
硬度为 2 的 ManVer® 2 硬度指示剂	100 mL MDB[1]	42532
硬度为 3 的滴定试剂	100 mL MDB[1]	42632
5.83 mL 塑料量筒	个	43800

[1]有标记的点滴瓶

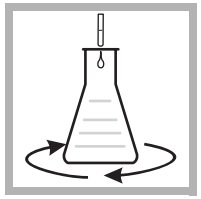
可选项目

说明	单位	货号
去离子水	500 mL	27249
标准硬度溶液， 20gpg，以 $CaCO_3$ 折算	500 mL	47949

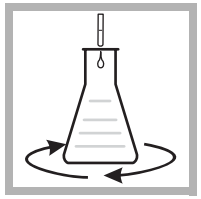
低量程 （1 至 20 mg/L）测试步骤



1. 将取样倒入烧瓶中至 100-mL 标记处。



2. 将硬度为 1 的 2 mL 缓冲溶液加入烧瓶中。摇匀。



3. 加入四滴硬度为 2 的指示剂。摇匀。

蓝色指示为软水。如果红色显现，请继续进行步骤 4。

4. 加入几滴硬度为 3 的滴定试剂。数一下颜色从红变蓝要添加的滴数。每加一滴都要摇匀。

5. 计算结果。每一滴硬度为 3 的滴定试剂相当于以碳酸钙 ($CaCO_3$) 折算的 1 mg/L。

高量程 （1 至 20 gpg （17 至 342 mg/L））测试步骤

1. 将取样加入塑料量筒中至顶部。

将取样倒入瓶中。

2. 将硬度为 1 的 3 滴缓冲溶液加入混合瓶中。摇匀。

3. 将 1 滴硬度为 2 的指示剂加入混合瓶中。摇匀。

蓝色指示为软水。如果红色显现，请继续进行步骤 4。

4. 加入几滴硬度为 3 的滴定试剂。数一下颜色从红变蓝要添加的滴数。每加一滴都要摇匀。

5. 计算结果。每一滴硬度为 3 的滴定试剂相当于以碳酸钙 ($CaCO_3$) 折算的 1 格令每加仑。1 格令每加仑 (gpg) 等于 17.1 mg/L。