Hardness, Iron and pH Test Kit
Model HA-62/HA-62A
Cat. No. 1837-00 (HA-62)
1837-01 (HA-62A)

HARDNESS TEST INSTRUCTIONS:

1. Fill the plastic measuring tube level full with the water to be tested. Pour contents of the tube into the square mixing bottle.
2. Add three drops of Buffer Solution, Hardness 1, and swirl to mix as shown in Figure 1.
3. Add one drop of ManVer® Hardness Indicator, Hardness 2, to the mixing bottle. Swirl to mix.
4. Add Titrant Reagent, Hardness 3, drop by drop, to the mixing bottle. Swirl the bottle after each drop is added and count each drop. Continue adding drops until the sample color changes from pink to blue.
5. The hardness in grains per gallon as calcium carbonate ($CaCO_3$) is equal to the number of drops of Titrant Reagent Hardness 3, required to bring about the color change.

WARNING: The chemicals in this kit may be hazardous to the health and safety of the user if inappropriately handled. Please read all warnings before performing the tests and use appropriate safety equipment.

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IRON TEST INSTRUCTIONS

To ensure accurate results read carefully before proceeding.

The iron color will develop regardless of the form in which iron is present in the sample. If present as dissolved iron, the color will develop almost instantly. If present in the form of rust, a minute or two is required for complete color development.

If the sample contains iron in the form of rust or precipitated iron, a representative sample may be obtained by shaking the container to stir up the rust before taking the sample to be tested. If a very large amount (30 mg/L or more) of iron is present, the color development may be inhibited, and the resulting color may be substantially less than that equivalent to 10 mg/L. This occurs when there is more iron present in the sample than its chemical equivalent of phenanthroline.

To prevent color inhibition, especially in cases where the result is suspect, test a sample which has been diluted with distilled or demineralized water. Fill the sample tube halfway to the mark with the sample to be tested; then fill to the mark with distilled water. Repeat the test, multiplying the answer by 2 to obtain the original iron concentration. If this answer is greater than the original answer, the original answer probably is wrong.

Further dilutions may be made to verify the first dilution. A 5 to 1 dilution may be made by adding one mL of sample to the tube and diluting to the 5-mL mark with distilled water before performing the test.

It is imperative that the tube be rinsed completely free of any solution used previously before conducting the test.

1. Fill a clean color viewing tube to the 5-mL mark with the water to be tested.
2. Tear open one FerroVer Iron Reagent Powder Pillow as shown in Figure 2. Add the contents of the pillow to the tube and shake to mix. An orange color will develop if iron is present.
3. Insert the tube of prepared sample into the right top opening of the comparator (Prepared Sample Position in Figure 3).
4. Fill the other color viewing tube with an untreated water sample. Place it in the left top opening of the color comparator (Untreated Sample Position in Figure 3).
5. Hold the comparator up to a light source such as a window, the sky or a lamp and view through the openings in front. Rotate the disc to obtain a color match. Read the mg/L iron (Fe) through the scale window.

STANDARD ADDITIONS ACCURACY CHECK

a. Snap the neck off an Iron Standard, 25 mg/L.

b. Use the syringe to add 0.1, 0.2, and 0.3 cc of standard to three 5-mL water samples and mix thoroughly. (Expel air bubble first and take care to use the cc scale - not the M scale.)

c. Analyze each sample as described above. The iron concentration should increase 0.5 mg/L (ppm) for each 0.1 cc of standard added.

d. If these increases do not occur, it must be concluded the first answer may also be incorrect. The source of the problem can be determined by using a logical troubleshooting approach whether the fault lies in dirty apparatus, old reagent, incorrect procedure or an interfering substance present in the test sample. Request Hach Publication 7004 for additional information on standard additions.

pH TEST INSTRUCTIONS

It is imperative that the tube be rinsed completely free of any previously used solution before conducting the test.

1. Fill a clean color viewing tube to the 5-mL mark with the water to be tested.
2. Add four drops of Phenol Red pH Indicator Solution to the tube and swirl to mix.
3. Insert the tube of prepared sample into the right top opening of the comparator (Prepared Sample Position in Figure 3).
4. Fill the other color viewing tube to the 5-mL mark with an untreated water sample. Place it in the left top opening of the comparator (Untreated Sample Position in Figure 3).
5. Hold the comparator up to a light source such as a window, the sky or a lamp and view through the openings in front. Rotate the disc to obtain a color match. Read the pH through the scale window.

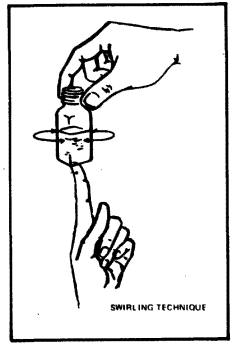

Figure 1

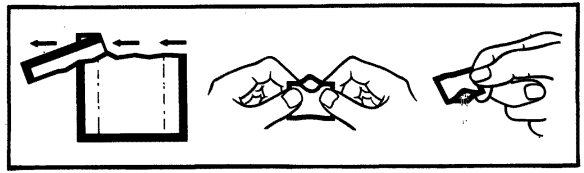

Figure 2

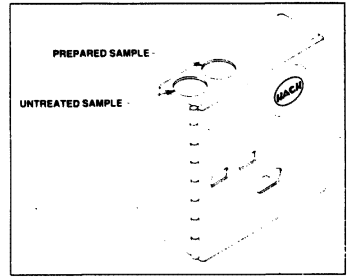

Figure 3

REPLACEMENTS

Cat. No.	Description	Unit
424-37	Buffer Solution, Hardness 1	118 mL MDB★
927-99	FerroVer Iron Reagent Powder Pillows	pk/100
425-37	ManVer Hardness Indicator,Hardness 2	118 mL MDB★
211-37	Phenol Red Indicator Solution	118 mL MDB★
426-37	Titrant Reagent, Hardness 3	118 mL MDB★
439-06	Bottle, mixing	pk/6
1732-00	Color Comparator	each
1713-00	Color Disc, Iron (Phenanthroline) 0-5 mg/L (Model HA-62)	each
1874-00	Color Disc, Iron (Phenanthroline) 0-10 mg/L (Model HA-62A)	each
1413-00	Color Disc, Phenol Red, pH 6.5 - 8.5	each
438-00	Measuring tube	each
46600-14	Caps for viewing tube	pk/4
46600-04	Viewing tube with caps	pk/4
12263-00	Syringe	each

★marked dropping bottle

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