

## HI 3842 Hardness High Range Test Kit



www.hannainst.com

Dear Customer,  
Thank you for choosing a Hanna Instruments Product.  
Please read the instruction manual carefully before using the chemical test kit. It will provide you with the necessary information for a correct use of the kit.  
Remove the chemical test kit from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any noticeable damage, notify your Dealer or the nearest Hanna office immediately.  
Each kit is supplied with:

- HI 3842-0 Hardness HR Reagent, 1 bottle with dropper (30 mL);
- Calmagite Indicator, 1 bottle with dropper (10 mL)
- 1 calibrated plastic vessel (50 mL).

**Note:** Any damaged or defective item must be returned in its original packing materials.

ISTR3842 07/15

### Specifications

Range	400 to 3000 mg/L (ppm) CaCO <sub>3</sub>
Smallest Increment	100 mg/L (ppm) CaCO <sub>3</sub>
Analysis Method	Drop count titration
Sample Size	25 mL
Number of Tests	50 (average)
Case Dimensions	115 x 105 x 80 mm (4.5 x 4.1 x 3.1")
Shipping Weight	120 g (4.2 oz.)

### Significance and Use

Historically, water hardness had been defined by the capacity of water to precipitate soap. The ionic species in water causing the precipitation were later found to be primarily calcium and magnesium. Currently, therefore, water hardness is actually a quantitative measure of these ions in the water sample.

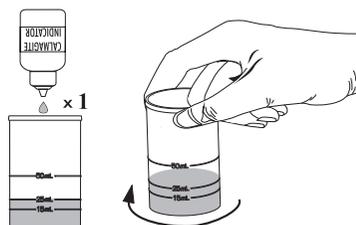
### Chemical Reaction

The Hanna Test Kit determines total hardness in water via a titrimetric method. Calcium and magnesium form a complex with EDTA and the reaction end-point is indicated by the change in color of the indicator from red to blue.

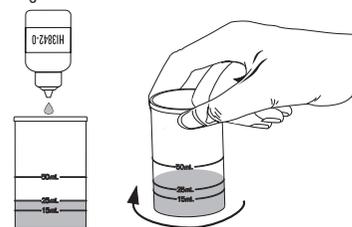
### Instructions

READ THE ENTIRE INSTRUCTIONS BEFORE USING THE KIT

- Remove the cap from the plastic vessel. Rinse the plastic vessel with the water sample, and fill it to the 25 mL mark with the sample.
- Add 1 drop of Calmagite Indicator and swirl the beaker.



- Add drops of HI 3842-0 reagent until the color changes from pink to blue while swirling the sample after each drop and counting the drops needed to obtain the color change.



- Use the Conversion Table or calculate the Hardness:

$$\# \text{ of DROPS} * 100 = \text{ppm CaCO}_3$$

$$1 \text{ ppm} = 1 \text{ mg/L} = 0.1^\circ\text{f} = 0.0556^\circ\text{D} = 0.07^\circ\text{E}$$

**Note:** ppm : is milligrams CaCO<sub>3</sub> per Liter  
°f : French Degrees  
°D : German Degrees  
°E : English Degrees

Store the reagent bottle out of direct sunlight.

### References

Adaptation of the E.P.A. recommended 130.2 method.

### Health and Safety

The chemicals contained in this test kit are safe in normal domestic term. Read Health and Safety Data Sheet before performing the test.

### TABLE 1 HARDNESS OF WATER

Drops:

- 1 soft
- 2 medium
- 3 hard
- ≥ 4 very hard

To measure: Hardness Low Range use HI 3840 Test Kit  
Hardness Medium Range use HI 3841 Test Kit

**TABLE 2  
CONVERSION DATA**

Drops	ppm	°f	°D	°E
3	300	30	16.7	21
4	400	40	22.2	28
5	500	50	27.8	35
6	600	60	33.3	42
7	700	70	38.9	49
8	800	80	44.4	56
9	900	90	50.0	63
10	1000	100	55.6	70
11	1100	110	61.1	77
12	1200	120	66.7	84
13	1300	130	72.2	91
14	1400	140	77.8	98
15	1500	150	83.3	105
16	1600	160	88.9	112
17	1700	170	94.4	119
18	1800	180	100.0	126
19	1900	190	105.6	133
20	2000	200	111.1	140
21	2100	210	116.7	147
22	2200	220	122.2	154
23	2300	230	127.8	161
24	2400	240	133.3	168
25	2500	250	138.9	175
26	2600	260	144.4	182
27	2700	270	150.0	189
28	2800	280	155.6	196
29	2900	290	161.1	203
30	3000	300	166.7	210