TOTAL & PHENOLPHTHALEIN ALKALINITY TEST KIT

CODE 4533

QUANTITY	CONTENTS	CODE
100	BCG-MR Indicator Tablets	T-2311-J
100	Phenolphthalein Tablets	T-2246-J
60 mL	*Alkalinity Titrration Reagent B	*4493PS-H
1	Test Tube, 5-10-15 mL, glass, w/cap	0778
1	Pipet, plain	0352

***WARNING:** Reagents marked with a * are considered to be potential health hazards. To view or print a Material Safety Data Sheet (MSDS) for these reagents see MSDS CD or our website. To obtain a printed copy, contact us by e-mail, phone or fax.

To order individual reagents or test kit components, use the specified code number.

PROCEDURE

PHENOLPHTHALEIN (P) ALKALINITY

1. Fill the test tube (0778) to 5 mL line with sample water.
2. Add one Phenolphthalein Tablet (T-2246). Cap and mix until disintegrated. If sample turns red, proceed to Step 3. If no red color develops, P Alkalinity is zero.
3. Fill pipet (0352) with *Alkalinity Reagent B (4493PS). While gently swirling the tube, hold pipet vertically and add *Alkalinity Reagent B drop by drop until color changes from red to colorless. Count the drops added. DO NOT DISCARD SAMPLE IF TESTING TOTAL ALKALINITY.
4. Calculate result. Record as ppm Phenolphthalein Alkalinity as $CaCO_3$.

Number of drops in Step 3 x 10 = ppm P Alkalinity

TOTAL (T) ALKALINITY

5. Add one BCG-MR Indicator (T-2311) to sample from previous procedure. Cap and shake until disintegrated. Sample color will be green.
6. Fill pipet (0352) with *Alkalinity Regent B (4493PS). While gently swirling the tube, hold pipet vertically and add *Alkalinity Reagent Bdrop by drop until color changes from green to pink. Count the drops added.

7. Multiply number of drops used in Step 6 by 10. Add to result from P Alkalinity procedure. Record as ppm Total Alkalinity as $CaCO_3$.

ppm T Alkalinity =
(Number of drops in Step 6 x 10) + ppm P Alkalinity

If testing only Total Alkalinity, do Steps 1, 5 and 6. Multiply number of drops used in Step 6 by 10. Record as ppm Total Alkalinity as $CaCO_3$.

CALCULATION OF ALKALINITY RELATIONSHIPS

The results obtained from the Phenolphthalein and Total Alkalinity determinations offer a means for the stoichiometric classification of the three principal forms of alkalinity present in many water supplies. The classification attributes the entire alkalinity to bicarbonate, carbonate and hydroxide, and attributes the absence of other weak acids of inorganic or organic composition, such as silica, phosphoric and boric.

This classification system assumes the incompatibility of hydroxide and bicarbonate alkalinities in the same sample. Since the calculations are on a stoichiometric basis, ion concentrations in the strictest sense are not represented in the results.

According to this scheme:

A. Carbonate alkalinity is present when the phenolphthalein alkalinity is not zero but is less than the total alkalinity.

B. Hydroxide alkalinity is present if the phenolphthalein alkalinity is more than one-half the total alkalinity.

C. Bicarbonate slkalinity is present if the phnolphthalein alkalinity is less than one-half the total alkalinity.

Relationships Between Phenolphthalein Alkalinity, Total Alkalinity, Carbonate Alkalinity, & Hydroxide Alkalinity

Result of Titration	Hydroxide Alkalinity as $CaCO_3$	Carbonate Alkalinty as $CaCO_3$	Bicarbonate Alkalinity as $CaCO_3$
P = 0	0	0	T
P < ½T	0	2P	T – 2P
P = ½T	0	2P	0
P > ½T	2P – T	2(T – P)	0
P = T	T	0	0