MAL　M-Alkalinity

Color development: Yellow → Green → Blue-green
Method　　: Absorptiometry with pH Indicator for Buffering Capacity
Range　　: 20 — 80 mg/L(ppm)
Reagent　　: WAK-MAL　Tube
Reaction time : 2 min. after drawing sample into the tube.

Cell : PACKTEST Square Cup
Wavelength : 470 nm, 560 nm

Procedure

1. Press【MAL】.
2. Press【OK】to switch to the photometry window.
3. Fill the Cell with the sample for 1.5 mL (up to line). (Fig.1)
4. Put the Cell in the cell box and press【Zero】. (Fig.2)
5. Suck the whole amount of the sample in the Cell into the tube and press【Start】at the same time. (Fig.3)
6. Shake the tube in Step 5 about 15 times to dissolve the reagent in the tube completely. (Fig.4)
7. Gently return the solution in the tube to the Cell, set it again in the cell box. (Fig.5)
8. After 2 minutes have elapsed, the concentration will be automatically displayed.

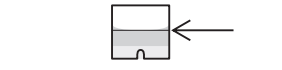
Fig.1

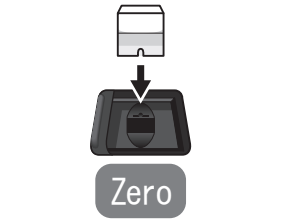

Fig.2

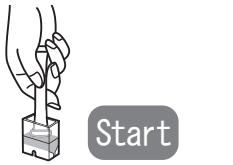

Fig.3

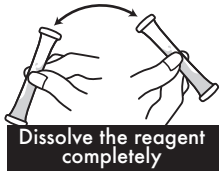

Fig.4

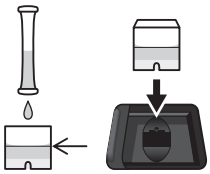
Fig.5

CAUTION

1. In this method, M-alkalinity (Total alkalinity: OH^-, HCO_3^-, CO_3^{2-}, etc.) in the sample is measured.
2. The measurement value is the concentration as calcium carbonate (mg/L as $CaCO_3$).
   The obtained result can be converted into the equivalent concentration (normality, Unit: meq/L) by multiplying it by 0.020.
   M-alkalinity of the typical natural water is derived from HCO_3^- (hydrogencarbonate, bicarbonate) . In order to convert the obtained result into the concentration of HCO_3^-, multiply it by 1.22.
3. The measurement result may be affected by unclean conditions. Clean up your hands before the measurement.
4. From the definition, M-alkalinity of the sample which is pH below 4.8 is zero. If the sample contains large amount of acid, the color of the solution in the tube may turn to dark yellow or orange.
5. Perform measurement with the sample temperature set to 15 to 40 ℃ .
6. Larger or smaller sample volume will imply higher or lower value, respectively.
   Use of a measuring pipette or the like to measure the volume of the sample (1.5mL) enables more accurate measurement.

Influence of coexisting substance

The stored calibration curve has been created by using the standard solution. If the influence of other substance is considered, check the measurement value by comparing it with the official method or by standard addition method.
The right chart is the list of interference data for acceptable level by adding each of the single substances to the standard solution.
Seawater does not affect the measurement, but it may contain alkalinity more than measurement range.
Less than 10% of ethanol does not affect the measurement.
In this method, alkalinity which is derived from phosphate (HPO_4^{2-}、PO_4^{3-}), borate (BO_2^-、$B_4O_7^{2-}$, etc.) and ammonia (NH_3) is measured, but phosphate which is more than 200 mg/L as PO_4^{3-} causes negative error.

≤ 1000mg/L,: H_3BO_3 (Boric acid)、Ba^{2+}、Br^-、Ca^{2+}、Cl^-、I^-、K^+、Mg^{2+}、Mn^{2+}、Na^+、NH_4^+、$N_2H_5^+$ (Hydrazinium)、NO_3^-、SO_4^{2-}、Glucose、Phenol
≤ 200mg/L,: $H_2PO_4^-$
≤ 50mg/L,: Anionic Surfactant
≤ 20mg/L,: Nonionic surfactant
≤ 10mg/L,: F^-、NO_2^-
≤ 5mg/L,: Residual Chlorine、Cationic Surfactant

Information on reagent

Refer to the usage that comes with PACKTEST.