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**Doc No :** PDAE201**Date :** 01-02-2024**Type :** AQUASOL**Product Code:** AE201**PRODUCT DATA SHEET****1 INFORMATION**

CODE: AE201

PARAMETER: TOTAL HARDNESS

RANGE: 2-40, 5-100 mg/l as CaCO<sub>3</sub>**2 METHOD**

Ethylenediaminetetraacetic acid and its sodium salts form a chelated soluble complex when added to a solution of certain metal cations. If a small amount of a dye such as Eriochrome black T is added to an aqueous solution containing calcium and magnesium ions at a pH of 10.0, the solution becomes wine red. If EDTA is added as a titrant, the calcium and magnesium has been complexed, and when all the calcium and magnesium has been complexed the solution turns from wine red to blue, making the end point of the titration.

**3 APPLICATION**

Drinking Water, Mineral Water, Well Water, Swimming Pool Water, Surface and Ground Water, Aquaculture, Boiler Water, Process Water, Industrial Wastewater, Effluent Water, Cooling System Water, Chiller Water etc

**4 INTERFERENCE**

Some metal ions interfere by causing fading or indistinct end points or by stoichiometric consumption of EDTA. Reduce this interference by adding certain inhibitor before titration. High concentration of heavy metal are present, determine calcium and magnesium by a non – EDTA method. suspended or colloidal organic matter also may interfere with the end point.

**5 METHOD CONTROL**

To Check test reagents,

Prepare 1000 ppm standard solution- Weigh 1 gm anhydrous calcium carbonate powder into volumetric flask, then add small quantity of 1:1 HCL until all CaCO<sub>3</sub> has dissolved. Add 200ml distilled water and boil for a few minutes to expel CO<sub>2</sub>. Cool, add few drops of methyl red indicator, and adjust to the orange colour by adding dilute NH<sub>4</sub>OH or 1:1 HCL as required. Then dilute it to 1 liter with distilled water. Dilute this standard solution with distilled water to 500 mg/l CaCO<sub>3</sub> and analyse as described in procedure card.

**6 REAGENTS AND ACCESSORIES**

Reagents: TH1S(1Nos), TH2(1Nos), TH3(1Nos), TH4(1Nos)

Accessories: 25ML Plastic Test Jar(1Nos), Plastic Spoon(1Nos), Procedure Label(1Nos)

**7 STORAGE**

The test reagents are stable up to the date stated on the pack when stored closed at ambient temperature

**8 REFERENCE**

APHA Standard Methods, 22nd ed., Method 2340-C – Standard Methods for Chemical Analysis of Water and Waste water. Diehl, H., C.A. Goetz & C.C. HACH. 1950.

**9 DIRECTION FOR USE**

1. Take 25 ml of water sample to be tested in the test jar.
2. Add one spoonful (provided herewith) of TH 1S.
3. Mix contents well to dissolve.
4. Add 10-12 drops\* of TH 2 and mix contents well.
5. If colour turns blue, it indicates there is 'No Hardness' in the water.
6. If colour turns red, it indicates there is 'Hardness'.
7. Now drop wise\* add TH 3, counting the number of drops while mixing, until the colour changes from red to blue.

If the expected hardness of the test sample is more than 40 ppm, then use TH 4 instead of TH 3.

Calculations:

$$\begin{aligned} \text{Total Hardness as ppm CaCO}_3 &= 2 \times (\text{Number of drops of TH 3}) \\ &= 5 \times (\text{Number of drops of TH 4}) \end{aligned}$$