

**Standard Method of Test for  
Determination of Calcium Carbonate Equivalence  
of Coquina and Other Soil Samples**

SCDOT Designation: SC-T- 6 (8/08)

**1. SCOPE**

- 1.1. This method covers a procedure for determining the calcium carbonate equivalence of a dried sample.

**2. REFERENCED DOCUMENTS**

- 2.1. SC Standard Specifications for Highway Construction (Edition of 2000), Section 304.04

**3. APPARATUS**

- 3.1. Ointment can
- 3.2. Oven maintained at 105-110°C
- 3.3. Desiccator
- 3.4. 250-mL Erlenmeyer flask
- 3.5. Balance or electronic scales capable of weighing to two decimal places
- 3.6. 25-mL pipette
- 3.7. Infrared hot plate
- 3.8. Steam bath
- 3.9. Weighing spatula
- 3.10. Reagents
- 3.11. Prestandardized 1.0 N HCl (Hydrochloric Acid)
- 3.12. Prestandardized 1.0 N NaOH (Sodium Hydroxide)
- 3.13. Distilled water (reagent water meeting ASTM D 1193 is considered satisfactory)
- 3.14. 1% Phenolphthalein solution

**4. TEST SPECIMENS**

- 4.1. The sample shall consist of approximately 200 grams of material. Larger samples shall be reduced to this size by the procedures in SC T 3.

## 5. PROCEDURE

- 5.1. The sample should be dried in an open ointment can placed in a 105-110°C oven overnight.
- 5.2. The sample is allowed to cool for 2-3 hours in a dessicator in the closed ointment can.
- 5.3. Place 1.00 g weighed to the nearest 0.1 mg into a 250-mL Erlenmeyer flask.
- 5.4. Add 25 mL of 1.0 N HCl by pipette
- 5.5. Swirl the suspension to mix.
- 5.6. Heat almost to boiling on a hot plate.
- 5.7. Place flask on a steam bath for 5 to 45 seconds to complete the reaction to dissolve all of the lime that will dissolve with dilute acid.
- 5.8. Dilute to 100 mL with distilled water.
- 5.9. Boil for 1 minute.
- 5.10. Cool sample to room temperature.
- 5.11. Add 5 drops of 1% phenolphthalein indicator.
- 5.12. Back titrate with 1.0 N NaOH to a pink color which lasts at least 15 seconds upon mixing while swirling.

## 6. CALCULATIONS

- 6.1. Determine the calcium carbonate equivalence of the sample as follows:

6.2.  $\%CaCO_3 \text{ equivalence} = \frac{(V - T) \times 5}{S} \times 100$

- 6.3. Where: V = mL of HCl originally added

- 6.4. T = mL of NaOH added

- 6.5. S = the lime sample weight in grams

## 7. REPORT

- 7.1. Report the Percent Total Calcium Carbonate Equivalence of the sample to the nearest 0.1 percent. Test results are reported on Lab Form 957.