

Method of Test for
DETERMINATION OF pH VALUE FOR AGGREGATES
DOTD Designation: TR 122

I. Scope

- A. This method of test describes the procedure for determining the pH for aggregate samples.

II. Apparatus

- A. Container – wide mouth, nonmetallic, 2 oz. or larger in size, glass beaker or leak proof cup.
- B. pH meter – suitable for laboratory analysis with either one or two electrodes.
1. Before use, inspect the electrodes to ensure that they contain a saturated solution of potassium chloride. Check manufacturers operating manual if electrodes require the addition of potassium chloride.
 2. When the electrodes are not being used for standardization or testing, keep them immersed in distilled water. (See Note 1.)

Note 1: Newer models of pH meters come equipped with a sleeve which is placed over the electrode during storage. If the electrode is supplied with a sleeve, a saturated solution of potassium chloride shall be placed in the sleeve. If the model is equipped with a sleeve the electrodes should not be placed in distilled water during storage.

- C. Standard buffer solutions of known pH values - use values of 5.0 and 7.0.
- D. Distilled water – with a pH value between 6.5 and 7.0 that has been freshly prepared (or freshly boiled) and cooled to room temperature.
- E. Balance – sensitive to 0.1 g.
- F. Thermometer– having a maximum of 1° graduations which cover the range of temperature at which tests are to be conducted.
- G. Glass stirring rod
- H. Graduated cylinder
- I. Soft cloth
- J. Wash bottle
- K. Spoon or small scoop
- L. Aggregate Test Report, DOTD 03-22-0745

III. Sample Preparation

- A. No special preparation is necessary for water sample unless soil is present. If soil is present, allow water sample to settle, then decant.
- B. Prepare soil sample in accordance with DOTD Designation: TR 411, Method B – Dry Preparation of Disturbed Samples.

IV. Standardization of pH Meter

- A. Inspect electrodes per manufacturer's instructions prior to use.
- B. Standardize the pH meter daily before determination of pH values or at any time an instrument malfunction is suspected.

1. Use a standard buffer solution in the range of the pH of the sample to be tested, if such information is known beforehand. Otherwise, begin with a standard solution having a pH of 7.0.
2. Pour 50 ± 5 cc of the solution into a clean beaker or cup.
3. Check the temperature of the solution and adjust the temperature controller of the pH meter accordingly.
4. Immerse the electrodes of the pH meter into the solution and gently swirl the container so as to obtain good contact between the solution and the electrodes.
5. Allow the electrodes to stand in the solution for 15 seconds before reading the pH value. (See Note 2.)
6. Read the pH value on the meter. If the value does not read the pH of the solution being used for standardization, adjust the pH meter to read the known pH (5.0 or 7.0).
7. Remove electrodes from the solution, rinse well with distilled water and wipe lightly with a soft cloth. Discard used buffer solution.

V. Procedure

A. Determination of pH Value of aggregate backfill.

1. Obtain a test specimen of aggregate weighing 50 ± 0.5 g and place into a clean beaker or cup.
2. Add 250 ± 5 cc of distilled water to the beaker or cup containing the test specimen.
3. Stir the test specimen solution vigorously to disperse aggregate uniformly in water.
4. Stir the test specimen solution at approximately 15 minute intervals for a period of one hour in order to disperse the aggregate and make sure all soluble material is in solution.
5. Record the beginning time and the time of each stirring on the worksheet.
6. Check the temperature of the test specimen solution and adjust the temperature controller of the pH meter accordingly.
7. Immediately before immersing electrodes into the test specimen solution, stir the solution then remove the glass stirring rod.
8. Immerse electrodes into the solution and gently swirl the container so as to obtain good contact between the solution and the electrodes.
9. Allow the electrodes to stand in the test specimen solution for 15 seconds before reading the pH value. (See Note2.)
10. Read the pH value. If the pH value is within ± 2.0 of the buffer solution used, record on the worksheet to the nearest 0.1 as pH value of sample. If the pH value is not within ± 2.0 , re-standardize the pH meter using the other buffer solution and rerun the test.
11. Remove electrodes from the test specimen solution, rinse well with distilled water. Wipe lightly with a soft cloth to remove any film formed on the electrodes.

Note 2: If the pH reading appears unstable when the electrodes are immersed in the buffer solution or test specimen, leave the electrodes immersed until the pH reading has stabilized. In some cases, the waiting period for the stabilization of the pH reading may take 5 minutes or more.

VI. Report

- A. For aggregate samples, the test information reported shall include the beginning time of test, the time of each dispersal and the pH value recorded to the nearest tenth (0.1). The pH value for individual samples shall also be reported on the Aggregate Test Report form (See Figure 1).

VII. Normal Test Reporting Time

Normal test reporting time is 24 hours.

