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METHOD OF TEST FOR ORGANIC IMPURITIES IN CONCRETE SAND

A. SCOPE

This method, which is a modification of AASHTO T 21, describes the procedure for making an approximate determination of the presence of injurious organic compounds in natural sands, which are to be used in cement mortar or concrete.

B. REFERENCES

AASHTO T 21 - Organic Impurities in Fine Aggregates for Concrete

C. MATERIALS

1. Glass bottles - approximately 350 mL or 470 mL nominal capacity colorless glass graduated bottles of approximately oval cross section, equipped with watertight stoppers or caps, not soluble in the specified reagents. In no case shall the maximum outside thickness of the bottles, measured along the line of sight used for the color comparison, be greater than 2.4 in. or less than 1.6 in. The graduations on the bottles shall be in milliliters, except that unmarked bottles may be calibrated and scribed with graduations by the user. In such case, graduation marks are required at only two points as follows:

   a. Fine Aggregate Level 130 mL, and

   b. NaOH Solution Level 200 mL.

2. Sodium hydroxide solution: 3 %. Dissolve 30 g of sodium hydroxide pellets, NaOH analytical reagent, in one liter of water.

3. Colored glass standard: An amber colored glass having a color similar to Gardner Color Standard No. 11.

D. TEST PROCEDURE

1. Split or quarter a representative portion of the sand weighing approximately 250 g.

2. Fill the 350 mL bottle to the 130 mL mark with the sand.

3. Add a sufficient amount of the 3 % sodium hydroxide solution to bring the level of the liquid to the 200 mL mark.

4. Place a stopper in the bottle and shake the bottle vigorously to eliminate air bubbles. When the air bubbles have been removed, add enough of the 3 % sodium hydroxide solution to bring the level of the liquid back up to the 200 mL mark.

5. Allow the bottle to stand undisturbed for 24 hr ± 0.5 hr then compare the color of the solution above the sample with the color of the colored glass standard. Make this color comparison by holding the bottle containing the test sample and the reference standard close together with the line of sight normal to the face or label side of the bottle and against a background which is substantially equal in color to the northern sky.

    a. If the color of the solution above the sample is similar to or lighter than the color of the standard, the sand is satisfactorily free of organic compounds and shall be reported as "satisfactory."

    b. If the color of the solution is darker than the standard, the sand is open to suspicion of containing injurious organic compounds and shall be reported as "unsatisfactory."

6. Note the presence of floating particles of wood bark, etc.

E. PRECAUTIONS

Be careful in handling the bottle when the reading is made to avoid disturbance of the contents, which causes the liquid to become clouded. Many sands show borderline color and require careful comparison with the reference color standard.

F. REPORTING OF RESULTS

Report the test result for organic impurities as either "satisfactory" or "unsatisfactory." Also, report the presence of significant quantities of wood, bark, or other debris.

G. HEALTH AND SAFETY

Sand may contain bacteria and/or organisms, which can be harmful to one's health. Wearing dust masks and protective gloves when handling materials is advised.

The sodium hydroxide (NaOH) pellets used to make up the solution for the color test are poisonous and can cause severe burns. Pellets poured too rapidly into water may splatter violently. If the sodium hydroxide comes in contact with the skin, flood the area affected as quickly as possible with large volumes of water, then wash with vinegar. If the eyes are involved, they should be immediately irrigated with warm water for 15 min. Contact a physician immediately for further instructions.

Store sodium hydroxide pellets in a tightly sealed non-metallic container, at a temperature below 140°F, in a well-ventilated area away from water, acids, metals, flammable liquids, and organic halogens. Store in a room with trapped floor drains, curbs, or gutters.

Mix solution in a nonmetallic container in a well-ventilated area. Use a container of sufficient size, preferably a flask or bottle, to reduce splattering hazards when adding the pellets to the water. Wear protective eyeglasses or chemical safety goggles and protective gloves when mixing solution.

Protective eyewear and gloves are required when handling solution and sample during the testing procedure.

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

Users of this method do so at their own risk.

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(California Test 213 contains 3 pages)