



pH Determination of Sands & Other Foundry Aggregates

SCOPE

This procedure outlines the approved method for determining the pH of foundry aggregates.

SUMMARY

The alkalinity or acidity of a solution or suspension is usually expressed in terms of pH. Technically, pH is a symbol which can be defined as the reciprocal of the logarithm of the hydrogen ion concentration. The pH of a neutral solution at room temperature is 7.0. Acid solutions vary in pH from 7.0 to 0, while the pH range of alkaline solutions is from 7.0 to 14.0. The pH scale is logarithmic; therefore, the intensity of an alkaline at a pH of 9.7 is twice the magnitude as it would be at 9.4, but 100 times the strength which existed at a pH of 7.7. pH should be determined using electrometric method of measuring the voltage which is developed by a Calomel electrode system. The Colorimetric method (litmus paper, etc.) is not recommended since the results cannot be measured precisely.

APPARATUS

- 250cm³ glass beaker
- 100cm³ graduated cylinder
- Magnetic stirrer
- Digital pH meter or similar
- Electronic balance capable of weighing to 2 decimal places

MATERIALS

- Buffer solutions pH 4.0, 7.0 and 9.0.
- Distilled or deionized water
- Sand sample to be tested

APPROVAL

DATE

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PROCEDURE

1. Prepare pH meter as follows:-
 - a. Switch to on position
 - b. Insert electrode into buffer solution, adjust until the meter reads the true pH of the buffer
 - c. Remove buffer solution, rinse electrode with distilled or deionized water and dry with absorbent paper

Note: It is common to standardize the machine with a buffer in the range in which normal samples will be measured, as by using pH 9.0 standard for Sodium Bentonite and pH 7.0 standard for Calcium Bentonite. To verify equipment accuracy, standardize with a given buffer, check with buffers with a wide variety of ranges as:-

Standardize at pH 7.0

Checked at pH 4.0 and 9.0

Machine should read ± 0.1 pH unit on each trial

2. To 100cm³ of distilled or deionized water, add 50g of dried sand. Stir at high speed without splashing until measurement of pH with meter is constant (check every 5 minutes). The pH is measured at room temperature.

RESULTS:

Record and report results to 1 decimal place.

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