



Acid Demand Value of Chromite Sand

SCOPE

This procedure outlines the approved method of testing and evaluating the acid demand of foundry aggregates.

SUMMARY

The time required for a given organic acid catalyzed bonded sand to set can be affected by alkaline impurities in the sand. Since most of these alkaline materials are insoluble in water, pH determination does not provide sufficient data which can be used as a control test for adjusting the ratio of the acid component to the organic component in the system. However, the acid demand value does provide data which can be used for control purposes, since the acid reacts with alkaline materials in the sand.

APPARATUS

- pH meter -
- 250cm³ beaker
- 2 x 50cm³ pipettes
- 50cm³ burette
- Magnetic stirrer

MATERIALS

- Sample of the foundry aggregate under test
- 0.1N Sodium Hydroxide solution
- 0.1N Hydrochloric Acid solution
- pH buffer solution 4.0
- Distilled or deionized water

APPROVAL	DATE
LM	
QM	

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PROCEDURE

1. Add 50g of dried sample to 50cm³ of distilled or deionized water and 50cm³ of 0.1N HCl.
2. Stir for five (5) minutes using the magnetic stirrer.
3. Allow mixture to stand for one (1) hour.
4. Back-titrate the resulting mixture with 0.1N NaOH to pH 3, 4 and 5 while stirring.
5. The amount of acid consumed at each pH level, determined at room temperature, is equivalent to the acid demand value of the sand.

TOLERANCE

The acid demand value at pH:-	3.00	4.00	5.00
shall not exceed:-	10.0cm ³	8.0cm ³	6.0cm ³

EXAMPLE

Typical data:-	47.0cm ³ 0.1N	NaOH required to reach pH 3.0
	48.0cm ³ 0.1N	NaOH required to reach pH 4.0
	48.5cm ³ 0.1N	NaOH required to reach pH 5.0

50.0cm ³ 0.1N HCl -	47.0cm ³ 0.1N NaOH =	3.0cm ³ acid consumed at pH 3.0
50.0cm ³ 0.1N HCl -	48.0cm ³ 0.1N NaOH =	2.0cm ³ acid consumed at pH 4.0
50.0cm ³ 0.1N HCl -	48.5cm ³ 0.1N NaOH =	1.5cm ³ acid consumed at pH 5.0

STANDARDIZATION & CALIBRATION OF EQUIPMENT

pH meter and electrode: Prior to all testing, standardize the equipment according to the manufacturer's recommendations. Use pH buffer solutions for 4.0, 7.0 and 9.0. When the electrode is not in use, immersing it in distilled or deionized water or maintaining an amount of distilled or deionized water in the rubber protective cap, will prevent the separation of Potassium Chloride (KCl) in the electrode. If KCl separates, do not use the electrode.

MISCELLANEOUS OBSERVATIONS

1. Samples should be run in duplicate when unknown. The first sample should be titrated more slowly in order to determine the general quantity of acid required and possibly should not be included in the tabulation of results. Rate of titration is important.
2. The fibre electrode is preferred with the use of pH meter. Sand occasionally enters the sleeve type electrode ruining the determination.

RESULTS:

Record results on appropriate Laboratory report sheet.

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