



MAGNESIUM OXIDE CMA ACTIVITY TEST

Principle

The rate at which magnesium oxide reacts with a dilute solution of acetic acid is used as a measure of activity. An excess of magnesia is used so that at the end point of the reaction, the solution goes from acidic to basic and is detected by a color change employing phenolphthalein indicator.

Safety

Caution should be used when working with any acids. This test procedure should only be performed by a trained and qualified Lab Analyst or Operator.

GR&R Values

The GR&R value for this test was determined to be 2.3.

Apparatus and Reagents

1. Acetic acid solution 1.00 + 0.01N, standardized confirmed ILS 1-23-78.
2. Waring blender, 2 speed with 32 oz. glass container.
3. Phenolphthalein soln. (1% solution in ethanol).
4. Balance with sensitivity of 0.01 gms.
5. Stop watch.
6. Thermometer.
7. Graduated cylinders, 100ml and 500ml.
8. **Mortar and pestle**

Procedure

1. Prior to the test, the water and the acetic acid solution should be brought to a temperature of $25 \pm 1^\circ\text{C}$.
2. **All process samples and unmilled samples are to be milled prior to testing. A representative sample must be used obtained by riffling, quartering or using the entire sample. Milling can be either in a mortar and pestle or ring and puck mill.**

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3. Weigh a 5.00 ± 0.02 grams sample of the magnesia sample.
4. Fill a 100 ml graduate to exactly the 100 ml mark with 1.00 N acetic acid solution.
5. Measure out 300 mls of water in a graduated cylinder and add it to the blender.
6. Carefully hold a thermometer in the blender and run blender until the temperature of the water is 28°C . Turn off blender. **Do not pre-warm the water or blender**

in a water bath. Do not let the thermometer touch the wall of the blender, this will lead to errors in the CMA.

7. Add 7 drops of phenolphthalein indicator solution.
8. Add the magnesia sample and immediately start the stopwatch and blender (low speed).
9. Exactly ten seconds after the start of the blender add 100 mls of the 1.00N acetic acid solution.
10. Stop the timer when the solution turns to a definite pink color. Calculate the reaction time in seconds as the CMA activity, by subtracting 10 seconds from the time registered on the stop watch.