CEM Dry Ashing Applications Note

Application Note 001A
Revision 10-01-2001

Sample Type: Wheat Flour Using Platinum Crucibles

Summary:

This method describes the determination of ash content in wheat flour using a PHOENIX™ OR MAS-7000™ with platinum crucibles. See Application Note 001 for flour ashing using quartz fiber ashing crucibles.

Required Equipment:

PHOENIX OR MAS-7000, platinum crucibles, liquid dispenser, balance capable of weighing to ± 0.1 mg.

Reagents Required:

Magnesium acetate
Ethyl alcohol (95%)

Method:

1. Prepare a solution of magnesium acetate in ethyl alcohol, 0.015:1 weight: volume. This can be done by adding 15 g of magnesium acetate to 1000 ml 95% ethyl alcohol. Be sure to filter the solution prior to use.

2. Program the PHOENIX OR MAS-7000 for 950 °C and allow the ashing furnace to reach the set temperature.

3. Program the PHOENIX OR MAS-7000 for 15 minutes.

4. Weigh a platinum crucible to the nearest ± 0.1 mg. Record the weight as Figure A. See notes 1 and 2 below.

   Steps 4-8 are used to determine a blank for the ashing method.

5. Drip 3 ml of the magnesium acetate solution into the crucible. Light the magnesium acetate with a match and flame under a fume hood.

6. Place the crucible in the furnace and ash it for 10 minutes. Remove the crucible and allow it to cool in a desiccator for 2 minutes.

7. Reweigh the crucible containing the ash to the nearest ± 0.1 mg. Record the weight as Figure B.

8. Calculate the ash blank using the following equation:

   Figure B - Figure A = Ash Blank (Figure C)

   Steps 9-13 are used to determine the ash in the flour sample.

9. Weigh a crucible to the nearest ± 0.1 mg. Record the weight as Figure D.

10. Place the crucible on the balance and tare. Weigh 2 grams of sample to the nearest ± 0.1 mg. into the crucible. Record the weight as Figure E. Spread the sample evenly in the crucible. Wet the entire sample with 3 ml of the magnesium acetate solution. Light the magnesium acetate with a match and flame under a fume hood until flame dies down.

11. Place the crucible with sample in the furnace and ash it for 15 minutes. Remove the crucible and allow it to cool in a desiccator for 2 minutes. Up to 4 samples can be placed in the furnace at one time.

12. Reweigh the crucible containing the ash to the nearest ± 0.1 mg. Record the weight as Figure F.

13. Calculate the percent ash using the following equation:

$$\% \text{ ash} = \frac{(F - C - D)}{E} \times 100$$