Safety: Wear the appropriate lab PPE and follow area safety rules.

Purpose: LOSS ON IGNITION (LOI) -- Magnesite (MgO)

Procedure:

Introduction

Magnesite (MgO) is the raw material source of Magnesium used for the production of Magnesium Sulfate ($MgSO_4$) at this location. It is the result product of roasting Magnesium Carbonate ($MgCO_3$) ore to MgO and CO_2 by suppliers. For yield and operating purposes it is important to know the extent of removal of CO_2 as delivered, as well as the moisture content.

Procedure

A small amount of sample is placed in a porcelain crucible, with appropriate weightings, and heated at 105°C, during which free moisture is driven off. Following this the crucible and contents are heated at 1000°C, during which any residual $MgCO_3$ is reduced to MgO and CO_2. Using the weight determinations, percentage figures can be calculated for H_2O and LOI, individually and in total, and these compared with the C of A submitted by the supplier. Any substantial difference is reported to the POC

Equipment.

Porcelain Crucible -- #C6450-4. 10 mL. Capacity

Weighing balance—B440 Satorius

Drying Oven (Low temperature) -- S/P TempCon Gravity convection N86205 Muffle Furnace (High temperature) -- Thermodyne Type 1300 120V

Dessicator—Jencon's 10" Dry Seal
Tongs—T5010 9" Steel
Small Spatula

Method

Results Recorded in Computer Log

1. Place the porcelain crucible in the 100°C oven for 10 minutes to assure dryness.
2. Tare the weighing scale to Zero.
3. Place the dry crucible on the scale and record the weight.
4. Add approximately 5 grams of sample to the crucible and record the combined weight.
5. Subtract the weight of the crucible from the combined weight. **This is the weight of the sample (A).**
6. Place the crucible in the 105°C oven for 30 minutes.
7. Remove the crucible from the oven and place it upon the scale. Record the weight.
8. Subtract the weight of the crucible and contents from the combined weight at the start. **This is the weight of the moisture H_2O removed – (B)**
9. Increase the setting for the muffle furnace to 1000°C
10. Place the crucible in the furnace, using forceps, for two hours.

11. Transfer the crucible, using the forceps, to the dessicator to cool.
12. Return the crucible to the furnace for 15 minutes
13. Repeat items 11 and 12 until constant weight is achieved.
14. Record the weight and subtract that weight from the weight at item 7. **This is the weight of the CO_2 driven off – (C).**

    B/A = % moisture in the sample
    C/A = % CO_2 driven off.
    (B+C) /A = %LOI
15. Return the muffle furnace temperature setting to 500ºC
16. Compare the results with the C of A for the carload from which the sample came, and report any substantial discrepancy to the POC.

TRAINING DOCUMENTATION

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Revision Number	Revision Date	Revision Author	Revision Description
00	03/28/06	CM	New Document
01	06/29/09	SL	-Placed Procedure on New Form