

750°C Ash Percent of Coal and other Energy Related Matrices

1. Introduction

Ash percentage is an analytical calculation used to determine weight of the sample after combustion in a controlled environment, to expel moisture and organics, leaving inorganic residue.

2. Interfaces with Other Methods

This method relies on the Calibration of Laboratory Scales and Analytical Balances method (EGL Method 29) and the method for Inorganic Sample Preparation (EGL Method 26).

3. Materials and Equipment

Furnace programmed to ash at 750°C for four hours and 20 ml ceramic crucibles.

4. Procedure

Weigh out approximately 1 g of sample material in a pre-weighed 20 ml ceramic crucible. Record the exact weight and subtract by the weight of the crucible. This is the “as determined” weight. Place the crucible containing the sample into a furnace and select the proper program to heat the sample at 750°C for four hours. After the program is complete and furnace temperature is below 100°C, remove crucible and place in a desiccator until it reaches room temperature. Re-weigh the crucible containing the inorganic residue and record exact weight. Subtract the weight of the dish from this weight, which is the “ash” weight.

Calculate the percent ash using the following equation: $\text{Ash (\%)} = (A/C) \times 100$, where C is the “as determined” weight of coal and A is the weight of ash.

5. Calibration and Quality Control Samples

Check the internal furnace temperature and program accuracy at least once annually with a thermocouple connected to a data logger. Adjust the program/settings control on the front of the furnace to ensure the correct program is selected.

Duplicate samples are analyzed to ensure the quality of data. Every job has at least one duplicate sample included and in larger jobs, a duplicate sample is included after every ten samples

6. Limits, Precautions, and Interferences

As a precaution, place the furnace under a hood to help dissipate heat and fumes.

7. Acceptance of Data

To determine if the data generated is acceptable, the duplicate sample weight must be within 10% of the original sample weight post combustion. If the weights deviate relatively by more than 10%, the same samples will be re-ashed at the same temperature for the same amount of time and re-weighed. If this does not result in weights which meet the acceptable data criteria, all of the ashed samples will be discarded and new sample will be ashed starting from the beginning of procedure.

8. Data Handling and Transfer

The weight is transferred from the balance to a Microsoft Excel™ template electronically. The template calculates the ash percent for each sample and the percentages are then transferred into a template which is saved in the inorganic parsed folder on the shared network drive.

9. References

American Society for Testing and Materials International [ASTM], 2007, Annual book of ASTM standards, section five, petroleum products, lubricants, and fossil fuels, Gaseous fuels; coal and coke: West Conshohocken, Pennsylvania, American Society for Testing and Materials International, v. 05.06, p. 352.

10. Attachments

None.

11. History of Changes

Revision 0: initial issue