

Georgia Department of Natural Resources

Environmental Protection Division Laboratory

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SOP 1-042 Rev. 3

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Percent Solids Determination – Method SW846-3541

Access to this SOP shall be available within the laboratory for reference purposes; the official copy of this SOP resides on the official Georgia EPD website at <https://epd.georgia.gov/about-us/epd-laboratory-operations>. Printed copies of this SOP will contain a watermark indicating the copy is an uncontrolled copy.

1 Scope and Application

- 1.1 This method is used for the determination of total solids in solid and semisolid samples, such as soils, sediments, sludges and industrial wastes. The method uses a precision drying oven where the samples will be dried overnight. This procedure is applicable to samples to be analyzed by SW846-8081A, SW846-8082 and SW846-8270C.

2 Definitions

- 2.1 Refer to Section 3 and Section 4 of the Georgia EPD Laboratory Quality Assurance Manual for Quality Control definitions.
- 2.2 Refer to GA EPD Laboratory SOP – Organics Data Validation, SOP 1-052, online revision.

3 Interferences

- 3.1 The determination of total solids is subject to negative error due to loss of volatile organic matter during drying.

4 Safety

- 4.1 Refer to Georgia EPD Laboratory Chemical Hygiene Plan, online revision.

5 Apparatus and Equipment

- 5.1 Spatulas: stainless steel or aluminum
- 5.2 Balance: Top loading, capable of accurately weighing to the nearest 0.01g
- 5.3 Balance: Analytical, capable of accurately weighing to the nearest 0.0001g
- 5.5 Aluminum weigh boats or small glass beakers
- 5.5 Oven: Fisher Isotemp or equivalent, 105°C ± 2°C
- 5.6 Desiccator

6 Reagents and Standards

6.1 Desiccant: Drierite with indicator or equivalent

7 Sample Collection

7.1 Not Applicable

8 Calibration

8.1 Analytical balances are serviced and calibrated once per year by an independent technician. Daily readings with certified weights are taken each morning to ensure calibration. A daily log is maintained with this information. All precision oven temperatures are measured with NIST approved thermometers and these measurements are recorded every morning in the daily temperature log.

9 Quality Control

9.1 Not Applicable

10 Procedure

10.1 Weigh out a labeled aluminum weigh boat or small beaker and record its weight in the Percent Solids log book.

10.2 Weigh out at least 10g of sample in the pre-weighed aluminum weigh boat or small beaker and record the weight of the boat/beaker and the wet sample.

10.3 Dry the sample in a precision oven overnight at 105°C ± 2°C.

10.4 After drying, remove the weigh boats with samples from the oven and allow cooling in a desiccator before reweighing.

10.5 Reweigh the dried sample and record the weight of the boat/beaker and dry sample.

10.6 Perform % Solids calculation as defined in Section 11.1.1.

11 Calculations

11.1 Total Solids or Dry Weight Determination

11.1.1 Equation:

$$\% \text{ Solids} = \frac{\text{weight of dry sample (g)}}{\text{weight of wet sample (g)}} \times 100$$

12 Waste Management

- 12.1 See GA EPD Laboratory SOP-EPD Laboratory Waste Management Standard Operating Procedures, SOP6-015, online revision.

13 References

- 13.1 GA EPD Laboratory SOP's – Initial Demonstration of Capability SOP 6-001, online revision and/or Continuing Demonstration of Capability SOP 6-002, online revision.
- 13.2 GA EPD Laboratory SOP – Automated Soxhlet Extraction – Method 3541, SOP 1-029, online revision.
- 13.3 GA EPD Laboratory SOP – Glassware Maintenance, SOP 1-015, online revision.
- 13.4 EPA Method SW846-3541 Automated Soxhlet Extraction – Rev.0, September 1994.

14 Reporting Limits (RLs), Precision and Accuracy Criteria, and Quality Control Approach

- 14.1 Not Applicable

15 Associated Labworks Test Codes

- 15.1 Not Applicable

Updates: Updated for online revision.