Designation: D8078 – 16

Standard Test Method for Ash Content of Asphalt and Emulsified Asphalt Residues[1]

This standard is issued under the fixed designation D8078; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method measures the ash content of an asphalt or emulsified asphalt residue.

1.2 A precision and bias statement for this standard has not been developed at this time. Therefore, this standard should not be used for acceptance or rejection of a material for purchasing purposes.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D6934 Test Method for Residue by Evaporation of Emulsified Asphalt

D6997 Test Method for Distillation of Emulsified Asphalt

D7497 Practice for Recovering Residue from Emulsified Asphalt Using Low Temperature Evaporative Technique

2.2 *AASHTO Standard:*[3]

AASHTO PP72 Recovering Residue from Emulsified Asphalt using Low-Temperature Evaporative Techniques

3. Summary of Test Method

3.1 A known amount of asphalt or emulsified asphalt residue is put into a crucible, which is then placed into a muffle furnace for a period of time to incinerate any organic materials present and allow gravimetric calculation of the ash content of the specimen.

4. Significance and Use

4.1 This test is used for determining the amount of inorganic or non-organic materials in an asphalt or emulsified asphalt residue. The emulsified asphalt residue can be obtained by methods such as Test Methods D6934 and D6997, Practice D7497, AASHTO PP72, or other agency specified methods. This test may be useful as an alternative to solubility tests when a confounding material creates an interference to the solubility test being performed acceptably. An example of an interfering material is a polymer which may be incompatible with the solubility test solvent and plugs the filter.

5. Apparatus

5.1 *Crucible*—Porcelain or quartz-fiber of sufficient size (normally 30 to 100 cm^3 capacity) and suitability for muffle furnace, may be used.

5.2 *Crucible Tongs*—Sufficient size to transfer the crucible to and from the muffle furnace safely.

5.3 *Balance,* capable of weighing a minimum of 200 g to within 0.001 g.

5.4 *Muffle Furnace*—Electric resistance heated or microwave heated furnace, capable of maintaining a temperature of 900 ± 25°C.

5.5 *Desiccator,* of suitable size to hold the crucibles during the cooling process.

6. Procedure

6.1 Preheat the muffle furnace to a temperature of 600°C (±10°C) prior to moving on to the next step in the procedure.

6.2 Heat an empty crucible at 600°C (±10°C) for 10 to 15 min. Cool the crucible to room temperature in the desiccator.

6.3 Place the empty crucible on the balance and record the weight (W_c) to the nearest 0.001 g. Tare the balance prior to placing the sample in the crucible.

6.4 Place approximately 2 to 3 g of the emulsified asphalt residue or asphalt to be tested into the crucible and record the sample weight (W_s) to the nearest 0.001 g. If the sample is hot

[1] This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.47 on Miscellaneous Asphalt Tests.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, http://www.transportation.org.

when put into the crucible, place the crucible with the sample into the desiccator to cool for 15 min prior to recording the sample weight (W_s) to the nearest 0.001 g.

NOTE 1—A pre-ashing procedure may be used prior to placing the sample into the muffle furnace, if deemed necessary by the muffle furnace manufacturer or prior testing of the sample. This requires placing the crucible onto an acceptable stand above a Bunsen burner. Adjust the height of the flame until it is just high enough to touch the crucible. Heat the sample until the sample flames, and discontinue when the flaming of the sample subsides. Using tongs remove the crucible from the stand and place it into the muffle furnace.

6.5 Place the crucible with the sample into the muffle furnace and incinerate the contents of the crucible for a minimum of 2 h, but no longer than 3 h.

6.6 Remove the crucible from the oven and allow to cool in a desiccator at room temperature a minimum of 30 min.

6.7 Record the crucible and ash sample weight (W_{c+a}) to the nearest 0.001 g. Return the crucible to the muffle furnace for an additional 30 min (±5 min).

6.8 Remove the crucible from the oven and allow to cool in a desiccator at room temperature a minimum of 30 min.

6.9 Record the crucible and ash sample weight (W_{c+a}) to the nearest 0.001 g, and if the weight is within 0.002 g of that recorded in 6.6, it may be considered to be at constant weight.

6.10 If a constant weight has not been achieved, repeat steps 6.7 – 6.9 until a constant weight is reached.

7. Calculation

7.1 This equation is used to determine the percent ash content (A_c) from the asphalt or emulsified asphalt residue sample. The ash content is calculated as follows:

$$\%A_c = \frac{W_{c+a} - W_c}{W_s} \times 100 \quad (1)$$

where:

A_c = ash content,
W_{c+a} = weight of crucible and ash sample,
W_c = weight of crucible, and
W_s = weight of sample (prior to testing).

Report the ash content (A_c) to the nearest 0.01 %.

8. Precision and Bias

8.1 Since a precision estimate for this standard has not been developed, this test method is to be used for research or informational purposes only. Therefore, this standard should not be used for acceptance or rejection of a material for purchasing purposes.

8.2 No information can be presented on the bias for measuring % Ash Content in this test method because no material having an acceptable reference value is available.

9. Keywords

9.1 ash content; asphalt; emulsified asphalt