

## ASPHALT REJUVENATING AGENT RESIDUE INSOLUBLE IN PETROLEUM ETHER

(An Arizona Method)

### SCOPE

1. (a) This method of test is intended for determining the percent of insoluble matter in an asphalt rejuvenating agent using petroleum ether.

(b) This test method may involve hazardous material, operations, or equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of any regulatory limitations prior to use.

(c) See Appendix A1 of the Materials Testing Manual for information regarding the procedure to be used for rounding numbers to the required degree of accuracy.

(d) Metric (SI) units and values are shown in this test method with English units and values following in parentheses. Values given for metric and English units may be numerically equivalent (soft converted) for the associated units, or they may be given as rounded or rationalized values (hard converted). Either the metric or English units along with their corresponding values shall be used in accordance with applicable specifications. See Appendix A2 of the Materials Testing Manual for additional information on the metric system.

### APPARATUS

2. Requirements for the frequency of equipment calibration and verification are found in Appendix A3 of the Materials Testing Manual. Apparatus for this test procedure shall consist of the following:

(a) Erlenmeyer flask, 125 mL capacity, with stopper.

(b) Drying oven, adequately ventilated, capable of maintaining a temperature of  $110 \pm 5$  °C ( $230 \pm 9$  °F).

- (c) Desiccator of adequate size to hold several crucibles.
- (d) Analytical balance capable of measuring the maximum weight to be determined and conforming to the requirements of AASHTO M 231, except the readability and sensitivity of any balance utilized shall be at least 0.001 gram.
- (e) Filtering apparatus, including:
  - (1) Vacuum pump
  - (2) Filtering flask, 250 mL capacity
  - (3) Filter tube with molded rubber gasket to hold Gooch crucible.
  - (4) Rubber tubing.
  - (5) Glass fiber pad conforming to AASHTO T 44.
  - (6) Gooch crucible, 4 cm high, 3.5 cm top diameter and 2.1 cm bottom diameter, prepared in accordance with AASHTO T 44.

## **MATERIALS**

- 3. Petroleum ether, 30 to 60 °C, reagent grade.

**CAUTION:** Always work under a hood, avoid breathing petroleum ether fumes, and keep material away from flame. It is highly flammable and toxic.

## **TEST PROCEDURE**

- 4. (a) Measure approximately 1 gram of asphalt rejuvenating agent residue into the tared Erlenmeyer flask and weigh to the nearest 0.001 gram.
- (b) Pour half of a 100 mL portion of petroleum ether into the flask and swirl the contents until all the residue has dissolved.
- (c) Add the balance of the 100 mL portion of petroleum ether and swirl the flask to mix the contents thoroughly. Place a stopper in the flask and set aside for 30 minutes.

(d) Place the tared Gooch crucible and filter mat into position on the filtering flask. Wet the mat with a small portion of petroleum ether.

(e) Apply light suction as decantation through crucible is begun. Use suction sparingly because it tends to clog the filter mat. Exercise utmost care in making the filtration to avoid stirring up any precipitate, in order that the filter mat may not be clogged and that the first decantation may be as complete as possible.

(f) Wash the flask with petroleum ether and pour the bulk of the insoluble material on the filter mat after the crucible has drained. Transfer all insoluble material from the flask to the crucible, using a rod with flattened rubber tip (a.k.a. "policeman") if necessary. Rinse the flask and policeman thoroughly with petroleum ether.

(g) Wash the insoluble matter in the crucible until the filtrate is substantially colorless, then apply strong suction to remove the remaining petroleum ether.

(h) Remove crucible from flask and wipe bottom of crucible clean.

(i) Dry the crucible in a  $110 \pm 5$  °C ( $230 \pm 9$  °F) oven for 15 to 20 minutes, cool in desiccator for 15 to 20 minutes and weigh to the nearest 0.001 gram.

NOTE: The crucible shall be cooled in the desiccator for the same amount of time that it is dried in the oven.

## CALCULATIONS

5. Calculate the percentage of the total sample which is insoluble in petroleum ether. The formula is as follows:

$$\text{Insoluble Residue, percent} = \frac{A}{B} \times 100$$

Where: A = total weight insoluble

B = total weight of sample

## REPORT

6. Report the total insoluble residue to the nearest 0.01 percent.