Designation: E 1385 – 00

Standard Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Steam Distillation[1]

This standard is issued under the fixed designation E 1385; 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 practice covers the procedure for separating visible quantities of water insoluble hydrocarbons from samples of fire debris.

1.2 This practice is recommended only for samples which have a detectable odor of petroleum distillates when examined at room temperature.

1.3 This practice can yield useful extracts by the application of a solvent to the distillation trap in the event that only small quantities of hydrocarbons are obtained.

1.4 Alternate separation and concentration procedures are listed in the referenced documents.

1.5 *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:*

D 1193 Specification for Reagent Water[2]

E 752 Practice for Safety and Health Requirements Relating to Occupational Exposure to Carbon Disulfide[3]

E 1386 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Solvent Extraction[4]

E 1387 Test Method for Ignitable Liquid Residues in Extracts from Samples of Fire Debris by Gas Chromatography[4]

E 1412 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration[4]

E 1413 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration[4]

E 1459 Guide for Physical Evidence Labeling and Related Documentation[4]

E 1492 Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory[4]

E 1618 Guide for Ignitable Liquid Residues in Extracts from Fire Debris Samples by Gas Chromatography-Mass Spectrometry[4]

3. Summary of Practice

3.1 The sample of fire debris is introduced into a container of appropriate size, and an appropriate amount of water is added to the sample and brought to a boil. Vapors produced are condensed in a volatile oil distillation apparatus. Petroleum distillate residues float on top of a column of water and are collected as visible liquids.

4. Significance and Use

4.1 Steam distillation is a classical separation technique, useful for preparing extracts for analysis by gas chromatography GC/MS or GC/IR. Distillates are suitable for analysis according to Test Method E 1387 or Guide E 1618.

4.2 The visible oily liquid extract can be used as a courtroom exhibit, unlike extracts produced by other separation procedures which are solutions rather than a neat liquid.

4.3 This practice is not useful for the separation of water soluble ignitable liquids such as alcohols or ketones.

4.4 Alternate separation and concentration methods are suggested if the concentration of flammable or combustible liquid residues is not detectable by odor.

4.5 This is a destructive technique that should only be used when a representative portion of the sample can be reserved for reanalysis. Those portions of the sample subjected to this procedure may not be suitable for resampling. Consider using passive headspace concentration as described in Practice E 1412.

5. Apparatus

5.1 *Distillation Apparatus-A Flask*, or container of appropriate size, which allows the sample to be introduced into the flask through the mouth, and a volatile oil distillation trap fitted with a condensing column or a cold finger.

6. Reagents and Materials

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on

[1] This practice is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of E30.01 on Criminalistics.

Current edition approved Dec. 10, 2000. Published March 2001. Originally published as E 1385 – 90. Last previous edition E 1385 – 95.

[2] *Annual Book of ASTM Standards,*Vol 11.01

[3] **Discontinued**. See 1995 *Annual Book of ASTM Standards,*Vol 11.03.

[4] *Annual Book of ASTM Standards,*Vol 14.02.