



Standard Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Solvent Extraction¹

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1. Scope

1.1 This practice covers the procedure for removing small quantities of flammable or combustible liquid residue from samples of fire debris using solvent to extract the residue.

1.2 This practice is suitable for successfully extracting flammable or combustible liquid residues over the entire range of concentrations.

1.3 Alternate separation and concentration procedures are listed in Test Method E 1387.

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.* For a specific hazard statement, see Note 1.

2. Referenced Documents

2.1 ASTM Standards:

E 752 Practice for Safety and Health Requirements Relating to Occupational Exposure to Carbon Disulfide²

E 1385 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Steam Distillation³

E 1387 Test Method for Ignitable Liquid Residues in Extracts from Samples of Fire Debris by Gas Chromatography³

E 1412 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration³

E 1413 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration³

E 1459 Guide for Physical Evidence Labeling and Related Documentation³

E 1492 Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory³

E 1618 Guide for Ignitable Liquid Residues in Extracts

from Fire Debris Samples by Gas Chromatography-Mass Spectrometry³

3. Summary of Practice

3.1 A sample of fire debris is extracted with an organic solvent. The extract is filtered and concentrated using dry nitrogen, filtered air, or inert gas.

4. Significance and Use

4.1 This practice is useful for preparing extracts from fire debris for later analysis by gas chromatography, GC/MS, or GC/IR.

4.2 This is a very sensitive separation procedure, capable of isolating quantities smaller than 1 μL of ignitable liquid residue from a sample.

4.3 This practice is particularly useful when the potential for fractionation during separation must be reduced, as when attempting to distinguish between various grades of fuel oil.

4.4 This practice is particularly useful for the extraction of nonporous surfaces such as glass, or the interior of burned containers. It is also particularly well suited to the extraction of materials from very small samples.

4.5 This practice can be hampered by coincident extraction of interfering compounds present in the fire debris samples.

4.6 This practice may not be useful for the extraction of some Class 0 and Class 1 ignitable liquids, which may evaporate during the concentration step.

4.7 This is a destructive technique. 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. Reagents and Materials

5.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. It is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society where such specifications are available.⁴ Other grades may be used, provided it is first

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

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² *Annual Book of ASTM Standards*, Vol 11.03.

³ *Annual Book of ASTM Standards*, Vol 14.02.

⁴ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC for suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopoeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.