



OSAC Research Needs Assessment Form

Title of research need:

Source Attribution for Ignitable Liquids from Fire Debris

Keywords:

Fire debris, ignitable liquids, source attribution, probabilistic methods

Submitting subcommittee(s):

Fire Debris and Explosives

Date Approved:

29JAN16

(If SAC review identifies additional subcommittees, add them to the box above.)

Background information:

1. Description of research need:

Development of methods capable of comparing IL extracted from fire debris to a suspected source.

2. Key bibliographic references relating to this research need:

1. Smallwood B, Philp R, Allen J. Stable carbon isotopic composition of gasolines determined by isotope ratio monitoring gas chromatography mass spectrometry. *Organic Geochemistry*. 2002;33(2):149-59.
2. Heo S-Y, Shin W-J, Lee S-W, Bong Y-S, Lee K-S. Using stable isotope analysis to discriminate gasoline on the basis of its origin. *Rapid Communications in Mass Spectrometry*. 2012;26(5):517-522.
4. Schwartz, Zeland; An, Yan; Konstantynova, Kateryna I.; Jackson, Glen P. Analysis of household ignitable liquids and their post-combustion weathered residues using compound-specific gas chromatography-combustion-isotope ratio mass spectrometry. *Forensic Science International* (2013), 233(1-3), 365-373.
5. Vergeer P; Bolck A; Peschier L J C; Berger C E H; Hendrikse J N. Likelihood ratio methods for forensic comparison of evaporated gasoline samples. *Science & Justice: Journal of the Forensic Science Society* (2014), 54(6), 401-11.

3a. In what ways would the research results improve current laboratory capabilities?

Currently direct links between IL extracted from fire debris and a suspected source cannot be made.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

Current methods or a knowledge base do not exist. This would be novel research. Future studies could build upon initial results.

3c. In what ways would the research results improve services to the criminal justice system?

Creation of direct links between criminal activity and suspect(s) would dramatically improve the investigation of these events.

4. Status assessment (I, II, III, or IV): I

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Subcommittee

Approval date:

February 12, 2016

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SAC

1. Does the SAC agree with the research need? Yes No

2. Does the SAC agree with the status assessment? Yes No

If no, what is the status assessment of the SAC:

Approval date:

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)