

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need:

Keyword(s):

Submitting subcommittee(s): **Date Approved:**

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

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

In most scientific papers and standards, the need for derivatization and some procedures are presented, however, no information on how to perform the technique on seized drugs samples in order to prevent partial derivatization or unreliable data are presented. The research should document the derivatizing agent used, show the derivatized molecular structure, the spectral data produced, as well as investigate any limitations or additional steps required when used on seized drugs samples (i.e. limitations, byproducts formed, additional sample preparation steps to eliminate non-target analytes from derivatization).

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

No.

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

RF Kranenburg, J Verduin, LI Stuyver, R de Ridder, A van Beek, E Colmsee, and AC van Asten. Benefits of derivatization in GC-MS-based identification of new psychoactive substances, Forensic Chemistry 20 (2020) 100273

BJ Lum, TA Brettell, JJ Brophy, DB Hibbert. Identification of a new class of thermolabile psychoactive compounds, 4-substituted 2-(4-X-2,5-dimethoxyphenyl)-N-[(2-hydroxyphenyl)methyl]ethanamine (25X-NBOH, X = Cl, Br, or I) by gas chromatography-mass spectrometry using chemical derivatization by heptafluorobutyric anhydride (HFBA), Forensic Chemistry 20 (2020) 100266.

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at <https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest>? Is your research need identified by NIJ?

No.

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

Research on the optimal derivatization procedures for seized drugs samples could assist laboratories in more efficient ways to analyze substances. Derivatization is a cost effective analytical method to allow laboratories to use existing GCMS instrumentation and avoid the need to purchase new, more costly instrumentation (e.g. LC-MS).

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

The research would help the subcommittee develop a standard that addresses derivatization techniques.

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

Derivatization is a cost-effective analytical method for laboratories to analyze thermally labile compounds that can degrade in current instrumentation, thus improving services to their customers.

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

III

| | 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.