Drug Enforcement Administration

Office of Forensic Sciences

SOP-METH-001

STANDARD OPERATING PROCEDURE

for the

ANALYSIS OF SUSPECTED METHAMPHETAMINE

Date Posted: 11/20/2023

Table of Contents

1.0 Introduction

SOP-METH-001 supplements Laboratory Operations Manual (LOM) 7500 – Analysis of Drug Evidence and outlines procedures for analyzing suspected methamphetamine samples. Reference LOM 7500 for evidence analysis policy.

The analytical scheme requires use of system-wide validated methods, if available, and laboratory-validated methods. Reference the appropriate validation packet for preparations and procedures.

2.0 Scope

NOTE: Analyses performed by SFL1 are exempt from these requirements.

This procedure:

A. Identifies methamphetamine, including salt form and isomer.

   1. Determines isomer only upon request.

B. Determines the purity of methamphetamine.

C. Identifies additional controlled substances, new psychoactive substances (NPS), and non-controlled substances.

D. Applies to solid samples (e.g. crystalline, powder, tablet).

E. Does not apply to residues, liquids, oils, or creams.

F. May apply to individual sub-exhibits.

   1. Follow SOP-METH-001 for sub-exhibits that are within the scope; refer to LOM 7500 or other SOPs for sub-exhibits that are not within the scope.

3.0 Analytical Scheme

3.1 Qualitative Analysis

A. If a negative result is obtained during qualitative testing, the SOP no longer applies and analysis should proceed via LOM 7500 or other SOP if applicable.

3.1.1 Single unit exhibits

A. Analyze using one of the following to obtain confirmatory data:

   1. Direct Analysis in Real Time – Mass Spectrometry (DART-MS): DART-MS and DART-MSMS.

   2. Gas Chromatography-Mass Spectrometry (GC-MS): GCLOW_MS01 or GCLOWX_MS01

      a. Dissolve each sample in an appropriate solvent(s) at an appropriate concentration to ensure methamphetamine peak shape meets LOM 7500 acceptance criteria in order to evaluate for the presence of any closely eluting substances.

B. Infrared Spectroscopy (IR): Analyze using IR01 for identification and salt form determination, unless impractical to do so.

C. Gas Chromatography (GC): Analyze using ISOM01 for isomer determination, when requested.

1. Analyze methamphetamine QC solution within the same sequence.

2. Report the d-isomer of methamphetamine on the DEA-113 when:

a. The purity of total methamphetamine hydrochloride in the sample is ≥ 80%.

b. The relative percentage of l-methamphetamine in the sample, if present, is equal to or less than the relative percentage of l-methamphetamine in the QC solution.

NOTE: In all other instances, the isomer of methamphetamine is not reported.

D. Perform additional qualitative testing as needed.

3.1.2 Multiple unit exhibits

3.1.2.1 Pre-composite Analysis

A. Color Test: Analyze each selected unit using the Marquis or Sodium Nitroprusside color test.

B. Analyze each selected unit using one of the following to obtain confirmatory data:

1. DART-MS: DART MS and DART-MSMS

2. GC-MS: GCLOW_MS01 or GCLOWX_MS01

a. Dissolve each sample in an appropriate solvent(s) at an appropriate concentration to ensure methamphetamine peak shape meets LOM 7500 acceptance criteria in order to evaluate for the presence of any closely eluting substances.

C. Perform additional qualitative testing as needed.

3.1.2.2 Composite Analysis

A. IR: Analyze using IR01 for salt form determination, unless impractical to do so.

B. GC: Analyze using ISOM01 for isomer determination, when requested:

1. Analyze methamphetamine QC solution within the same sequence.

2. Report the d-isomer of methamphetamine on the DEA-113 when:

a. The purity of total methamphetamine hydrochloride in the sample is ≥ 80%.

b. The relative percentage of l-methamphetamine in the sample, if present, is equal to or less than the relative percentage of l-methamphetamine in the QC solution.

NOTE: In all other instances, the isomer of methamphetamine is not reported.

C. Perform additional qualitative testing as needed.

3.2 Quantitative Analysis

A. Perform a quantitation on the composite using a system-wide validated method or a laboratory-validated method.

1. UV-Vis Method: DEA 503

B. If UV-Vis is unavailable or is inappropriate for the sample type:

1. GC Method: DEA 103, DEA 103S, or DEA 103L (LTM)
2. LC Method: DEA 273 or laboratory-validated
3. NMR Method: DEA 440H/450H/460H

Effective Date/Revision History

Revision No.	Effective Date	Summary of Changes
0	12/1/2020	Original document issued.
1	4/19/2021	• Color test reagent preparation updated • Appendix A – Reporting Statements added • Policy references updated
2	10/25/2021	• Analytical scheme updated to harmonize the GC-MS method for single unit and multi-unit analysis • Formatting update from bullets to letters and numbers
3	08/01/2022	Re-issued to replace SOP-METH-001 Revision 2. Major changes include: • Reorganization to include only information pertaining to the analytical scheme • Removal of sections pertaining to equipment and solution/sample preparation • Removal of statements referring to policy • Removal of Appendix A – Reporting Statements
3.1	01/25/2023	Added DEA 103 to the list of GC quantitation methods.
4	11/06/2023	• Removed residues from the scope • Added DART-MS to the analytical scheme • Added DEA 103S to the list of GC quantitation methods • Updated ADM references to LOM 7500

End of Document