SFL8

Methods: GS1_361930; GS1F_361929; GS1F_361941; GS1_361907

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC-FID suitable solvent can be used to include: methanol, chloroform, ether, hexane, etc. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection. When used for screening at the one percent level, the sample should be prepared at a minimum 10 mg/mL concentration in either SolvA or SolvB. SolvA: 0.01 mg/mL Tetracosane in 4:1 Chloroform:Methanol. SolvB: 0.01 mg/mL Tetracosane in Chloroform; Saturated with ammonium hydroxide.

Method Parameters:

Instrument: Agilent 7890B GC-FID LTM

Detector Temperature:

- *GS1_361930; GS1F_361929; GS1F_361941:* 300 °C
- *GS1_361907:* 280 °C

Column Type and Dimensions: Pre-Column: DB-5 1 m long, 0.180 mm ID, 0.18 µm film thickness;
Column: DB-5MS LTM 15 m long, 0.250 mm ID, 0.25 µm film thickness

Inlet Temperature: 280 °C

Minimum Injection Volume: 1 µL

Injection Mode: Split

Maximum Split Ratio: 25:1

Carrier Gas and Flow:

- *GS1_361930:* Hydrogen and 5.118 mL/min
- *GS1F_361929; GS1F_361941; GS1_361907:* Hydrogen and 3.25 mL/min

Make-up Gas: Nitrogen

Control Mode: Constant flow

Oven Program Set Points: 300 °C for 4.2 min

LTM Program Set Points: 100 °C; ramp 80 °C/min to 300 °C hold for 1.7 min

Minimum Run Time: 4.2 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report)**:**

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability:

- *GS1_361930*: Individual retention times measured for representative compounds, are within 0.1 minutes of the average of 30 injections.

- *GS1F_361929; GS1F_361941; GS1_361907*: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility:

- *GS1_361930*: Individual retention times measured for representative compounds during 2 weeks are within 0.1 minutes of the values measured on week 1.
- *GS1F_361929; GS1F_361941; GS1_361907*: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

SFL8

Methods: GS1_361932

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC-FID suitable solvent can be used to include: methanol, chloroform, ether, hexane, etc. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection. When used for screening at the one percent level, the sample should be prepared at a minimum 10 mg/mL concentration in either SolvA or SolvB. SolvA: 0.01 mg/mL Tetracosane in 4:1 Chloroform:Methanol. SolvB: 0.01 mg/mL Tetracosane in Chloroform; Saturated with Ammonium Hydroxide.

Method Parameters:

Instrument: Agilent 7890B GC-FID
Detector Temperature: 280 °C
Column Type and Dimensions: HP-5 10 m long, 0.320 mm ID, 0.25 µm Film Thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 50:1
Carrier Gas and Flow: Hydrogen and 1.0 mL/min
Make-up Gas: Nitrogen
Control Mode: Constant Flow
Oven Program Set Points: 110 °C; 35 °C/min to 170 °C; 25 °C to 210 °C/min hold 1 min; 75 °C/min to 320 °C hold 1.7 min
Minimum Run Time: 7.48 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability:

- *GS1_361932:* Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility:

- *GS1_361932*: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

SFL8

Method: GS1B_361942

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC-FID suitable solvent can be used to include: methanol, chloroform, ether, hexane, etc. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection. When used for screening at the one percent level, the sample should be prepared at a minimum 10 mg/mL concentration in either SolvA or SolvB.SolvA: 0.01 mg/mL Tetracosane in 4:1 Chloroform:Methanol. SolvB: 0.01 mg/mL Tetracosane in Chloroform; Saturated with Ammonium Hydroxide.

Method Parameters:

Instrument: Agilent 7890B LTM GC-FID
Detector Temperature: 300 °C
Column Type and Dimensions: DB-5MS 15 m long, 0.25 mm ID, 0.25 µm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 25:1
Carrier Gas and Flow: Hydrogen and 3.25 mL/min
Make-up Gas: Nitrogen
Control Mode: Constant Flow
Oven Program Set Points: 300 °C for 4.2 min
LTM Program Set Points: 100 °C; ramp 80 °C/min to 300 °C hold for 0.5 min
Minimum Run Time: 4.2 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Methods: MJ1_361790 and MJ1_361880

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: Limited purpose (Delta-9-THC)

Sample Preparation:

Prepare solutions using appropriate organic solvent and filtration techniques, as needed.

Method Parameters:

Instrument: Agilent 7890A GC-FID
Detector Temperature: 280 °C
Column Type and Dimensions: ZB-5MS 20 m long, 0.18 mm ID, 0.18 µm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 25:1
Carrier Gas and Flow: Hydrogen and 1.1 mL/min
Make-up Gas: Nitrogen
Control Mode: Constant Flow
Oven Program Set Points: 270 °C for 2.0 min
Minimum Run Time: 2.0 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report)**:**

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. Earliest eluting compound met minimum retention factor criteria and fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Method: MJ1_361934

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: Limited purpose (Delta-9-THC)

Sample Preparation:

Prepare solutions using appropriate organic solvent and filtration techniques, as needed.

Method Parameters:

Instrument: Agilent 7890B LTM GC-FID
Detector Temperature: 300 °C
Column Type and Dimensions: Pre-Column: DB-5MS; 1 m long, 0.18 mm ID, 0.18 µm film thickness
Column: DB-5MS; 15 m long, 0.25 mm ID, 0.25 µm film thickness
Inlet Temperature: 300 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 25:1
Carrier Gas and Flow: Hydrogen and 3.25 mL/min
Make-up Gas: Nitrogen
Control Mode: Constant Flow
Oven Program Set Points: 300°C for 1.75 min
LTM Program Set Points: 100 °C, ramp 80 °C/min to 300 °C, hold 1.7 min
Minimum Run Time: 1.75 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. Earliest eluting compound met minimum retention factor criteria and fulfilled the repeatability and reproducibility acceptance criteria

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Methods: MTPA1_361932; MTPA1_361933; MTPA1_361995B; MTPA1_361934
MTPA1_361790; MTPA1_361880; MTPA1_361907; MTPA1_361928

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: Limited Purpose

- *MTPA1_361932* and *MTPA1_361933*: l-amphetamine, d-amphetamine, l-methamphetamine, d-methamphetamine
- *MTPA1_361995B*: Enantiomers of phenethylamines
- *MTPA1_361934; MTPA1_361790; MTPA1_361880; MTPA1_361907; MTPA1_361928*: d-methamphetamine and l-methamphetamine

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Sample Preparation:

Add approximately 5-10 mg sample/standard to 1 mL DI water and basify with 1N NaOH (pH to 14). Add 1 mL of hexane and shake or vortex the bi-layer to extract the base drug into the hexane layer. Add 1-2 drops of pyridine followed by 1-2 drops of 0.1M MTPA ((R)-(-)α-methoxy-α-(trifluoromethyl)phenylacetyl chloride) to the hexane layer. Allow the reaction to proceed at ambient temperature for approximately 1 minute. Shake or vortex the bi-layer to quench the reaction. Filter the hexane layer for analysis.

Method Parameters:

Instrument:

- Agilent 7890B GC-FID:
  - *MTPA1_361932; MTPA1_361933; MTPA1_361995B; MTPA1_361934; MTPA1_361907; MTPA1_361928*
- Agilent 7890A GC-FID:
  - *MTPA1_361790; MTPA1_361880*

Detector Temperature: 280 °C
Column Type and Dimensions: ZB-5MS 20 m long, 0.18 mm ID, 0.18 µm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 50:1
Carrier Gas and Flow:

- Hydrogen and 1.1 mL/min:
  - *MTPA1_361932; MTPA1_361933; MTPA1_361790; MTPA1_361880; MTPA1_361934; MTPA1_361907; MTPA1_361928*
- Hydrogen and 1.1268 mL/min:
  - *MTPA1_361995B*

Make-up Gas: Nitrogen
Control Mode:

- Constant Pressure:
  - *MTPA1_361932*; *MTPA1_361933*
- Constant Flow:
  - *MTPA1_361995B; MTPA1_361790; MTPA1_361880; MTPA1_361934; MTPA1_361907; MTPA1_361928*

Oven Program Set Points: 210 °C for 4.5 min

Minimum Run Time: 4.5 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. Earliest eluting compound met minimum retention factor criteria and fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility:

- *MTPA1_361932*; *MTPA1_361995B; MTPA1_361790; MTPA1_361880; MTPA1_361934; MTPA1_361907; MTPA1_361928*:
    - Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.
- *MTPA1_361933*:
    - Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Method: MTPA2_361932; MTPA2_361933; MTPA2_361995B

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: Limited purpose (enantiomers of phenethylamines)

Sample Preparation:

Add approximately 5-10 mg sample/standard to 1 mL DI water and basify with 1N NaOH (pH to 14). Add 1 mL of hexane and shake or vortex the bi-layer to extract the base drug into the hexane layer. Add 1-2 drops of pyridine followed by 1-2 drops of 0.1M MTPA ((R)-(-)α-methoxy-α-(trifluoromethyl)phenylacetyl chloride) to the hexane layer. Allow the reaction to proceed at ambient temperature for approximately 1 minute. Shake or vortex the bi-layer to quench the reaction. Filter the hexane layer for analysis.

Method Parameters:

Instrument: Agilent 7890B GC-FID
Detector Temperature: 280 °C
Column Type and Dimensions: ZB-5MS 20 m long, 0.18 mm ID, 0.18 µm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 50:1
Carrier Gas and Flow: Hydrogen and 1.1 mL/min
Make-up Gas: Nitrogen
Control Mode:

- *MTPA2_361932***:** Constant Pressure
- *MTPA2_361933; MTPA2_361995B***:** Constant Flow

Oven Program Set Points: 210 °C for 7.5 min
Minimum Run Time: 7.5 min

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. Earliest eluting compound met minimum retention factor criteria and fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility:

- *MTPA2_361932; MTPA2_3619995B*: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

- *MTPA2_361933*: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Method: GS1_361878; GS1_361851

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC suitable solvent can be used to include: methanol, ether, hexane, etc. Non-chlorinated solvents must be used with this method due to chemical interactions between the hydrogen carrier gas and chlorinated solvents. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection.

Method Parameters:

Instrument: Agilent 7890A GC with Agilent 5975C Inert XL MS
Column Type and Dimensions: HP-5MS; 15 m long; 0.25 mm ID; 0.25 μm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 μL
Injection Mode: Split
Maximum Split Ratio: 40:1
Carrier Gas and Flow: Hydrogen and 2.6578 mL/min
Control Mode:

- *GS1_361878*: Constant pressure
- *GS1_361851*: Constant flow

Oven Program Set Points: 80 °C for 0.2 min; 95 °C/min to 115 °C, hold for 0 min; 65 °C/min to 175 °C, hold for 0 min; 45 °C/min to 300 °C, hold for 0.9 min
Minimum Run Time: 5.1693 min
Detector: See *MS_361878* and *MS_361851* Mass Spectrometry Method Parameters

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility:

- *GS1_361878*: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

- *GS1_361851*: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Methods: MS_361878; MS_361851

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (EI)

Scope: General purpose

Sample Preparation:

GC effluent

Method Parameters:

Instrument: Agilent 7890A GC with Agilent 5975C Inert XL
Mass Analyzer: Quadrapole
Ionization Mode: Electron Ionization
Scan Range: 35 - 550 m/z
Scan Speed: 2.83 scans/second
Source Temperature:

- *MS_361878*: 250 °C
- *MS_361851*: 350 °C

MS Temperature: 150 °C
Transfer Line Temperature: 250 °C
Tune Type: standard

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall sample spectral pattern corresponds to that of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum are of the same nominal mass as those in the reference spectrum. The molecular ion is present in the sample spectrum if it is present in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Methods: GS1_361905

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC suitable solvent can be used to include: methanol, chloroform, ether, hexane, etc. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection. When used for screening at the one percent level, the sample should be prepared at a minimum 10 mg/mL concentration in either SolvA or SolvB. SolvA: 0.01 mg/mL Tetracosane in 4:1 Chloroform:Methanol. SolvB: 0.01 mg/mL Tetracosane in Chloroform; Saturated with ammonium hydroxide.

Method Parameters:

Instrument: Agilent 7890B GC with Agilent 5977A MS
Column Type and Dimensions: Two Pre-Columns: 1 m long: 250 µm ID; 0.25 µm film thickness; Column: DB5-MS; 15 m long; 250 µm ID; 0.25 µm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 40:1
Carrier Gas and Flow: Helium and 2.0 mL/min
Control Mode: Constant flow
Oven Program Set Points: 280°C
LTM Program Set Points: 90 °C for 0.1 min; 180 °C/min to 225 °C for 0.3 min; 70 °C/min to 300 °C for 1.2 min
Minimum Run Time: 3.421 min
Detector: See *MS_3616905* Mass Spectrometry Method Parameters

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

SFL8

Method: MS_361905

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (EI)

Scope: General purpose

Sample Preparation:

GC effluent

Method Parameters:

Instrument: Agilent 7890B GC with Agilent 5977A MS
Mass Analyzer: Quadrapole
Ionization Mode: Electron Ionization
Scan Range: 35 - 550 m/z
Scan Rate: 3,125 [N=1]
Source Temperature: 230 °C
MS Temperature: 150 °C
Transfer Line Temperature: 280 °C
Tune Type: standard

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall sample spectral pattern corresponds to that of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum are of the same nominal mass as those in the reference spectrum. The molecular ion is present in the sample spectrum if it is present in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Methods: GS1_361917; GS1_361947; GS1_361952; GS1_361955; GS1_361997; GS1_361954; GS1_361949; GS1_361919; GS1_361953; GS1_361948; GS1_361936; GS1_361935

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC suitable solvent can be used to include: methanol, chloroform, ether, hexane, etc. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection. When used for screening at the one percent level, the sample should be prepared at a minimum 10 mg/mL concentration in either SolvA or SolvB. SolvA: 0.01 mg/mL Tetracosane in 4:1 Chloroform:Methanol. SolvB: 0.01 mg/mL Tetracosane in Chloroform; Saturated with ammonium hydroxide.

Method Parameters:

Instrument:

- Agilent 7890B GC with Agilent 5977A MS:
  - *GS1_361917; GS1_361954; GS1_361919; GS1_361936; GS1_361935*
- Agilent 7890B GC with Agilent 5977B MS*:*
  - *GS1_361947; GS1_361952; GS1_361955; GS1_361997; GS1_361949; GS1_361953; GS1_361948*:

Column Type and Dimensions:

- ZB-5MS; 15 m long; 250 µm ID; 0.25 µm film thickness*:*
  - *GS1_361917*
- HP-5MS; 15 m long; 250 µm ID; 0.25 µm film thickness*:*
  - *GS1_361947; GS1_361952; GS1_361955; GS1_361997; GS1_361954; GS1_361949; GS1_361919; GS1_361953; GS1_361948; GS1_361936; GS1_361935*

Inlet Temperature: 280 °C

Minimum Injection Volume: 1 µL

Injection Mode: Split

Maximum Split Ratio: 50:1

Carrier Gas and Flow:

- Helium and 1.5061 mL/min*:*
  - *GS1_361917; GS1_361947; GS1_361952; GS1_361955; GS1_361954; GS1_361949; GS1_361953; GS1_361948; GS1_361936; GS1_361935*
- Helium and 1.5 mL/min*:*
  - *GS1_361997; GS1_361919*

Control Mode: Constant flow

Oven Program Set Points: 110 °C for 0.3 min; 65 °C/min to 175 °C for 0 min; 45 °C/min to 200 °C for 0 min; 35 °C/min to 310 °C for 1 min

Minimum Run Time: 5.99 min

Detector: See *MS_361917; MS_361947; MS_361952; MS_361955; MS_361997; MS_361954; MS_361949; MS_361919; MS_361953; MS_361948; MS_361936; MS1_361935* Mass Spectrometry Method Parameters

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report)**:**

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility:

- *GS1_361917; GS1_361947; GS1_361955; GS1_361953; GS1_361936:*
    - Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.
- *GS1_361952; GS1_361997; GS_361954; GS_361949; GS1_361919; GS1_361948; GS1_361935*:
    - Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Method: LS1_361919

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: Limited purpose (amphetamine, phentermine, methamphetamine, N,N-dimethylamphetamine, pseudoephedrine)

Sample Preparation:

Prepare solution using appropriate organic solvent and filtration techniques as needed.

Method Parameters:

Instrument: Agilent 7890B equipped with an Agilent 5977A MS
Column Type and Dimensions: DB-5MS 15 m long, 0.25 mm ID, 0.25 µm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 µL
Injection Mode: Split
Maximum Split Ratio: 50:1
Carrier Gas and Flow: Helium, 1.5061 mL/min
Control Mode: Constant Flow
Oven Program Set Points: 110 °C for 0.3 min; ramp 65°/min to 175°C; hold for 0.2 min.
Minimum Run Time: 1.5 min
Detector: See *MS_361919* Mass Spectrometry Method Parameters.

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed. Earliest eluting compound met minimum retention factor criteria and fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections, and the individual relative retention times are within 1% of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1, and the individual relative retention times during 6 weeks are within 1% of the values measured on week 1.

SFL8

Methods: MS_361917; MS_361947; MS_361952; MS_361955; MS_361997; MS_361954; MS_361949; MS_361919; MS_361953; MS_361948; MS_361936 and MS_361935

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (EI)

Scope: General purpose

Sample Preparation:

GC effluent

Method Parameters:

Instrument:

- Agilent 7890B GC with Agilent 5977A MS
  - *MS_361917; MS_361954; MS_361919; MS_361936; MS_361935*
- Agilent 7890B GC with Agilent 5977B MS
  - *MS_361947; MS_361952; MS_361955; MS_361997; MS_361949; MS_361953; MS_361948*

Mass Analyzer: Quadrapole
Ionization Mode: Electron Ionization
Scan Range: 35 - 550 m/z
Scan Rate: 3,125 [N=1]
Source Temperature: 230 °C
MS Temperature: 150 °C
Transfer Line Temperature: 280 °C
Tune Type: standard

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall sample spectral pattern corresponds to that of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum are of the same nominal mass as those in the reference spectrum. The molecular ion is present in the sample spectrum if it is present in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Method: GS1_361918

Separation of Controlled and Non-controlled Substances by Gas Chromatography

Scope: General purpose

Sample Preparation:

As a general screening method, the sample solution preparation is primarily at the analyst's discretion. Any GC suitable solvent can be used to include: methanol, chloroform, ether, hexane, etc. Sample concentration is also at the analyst's discretion. For optimal instrument performance, samples with insolubles should be filtered before injection. When used for screening at the one percent level, the sample should be prepared at a minimum 10 mg/mL concentration in either SolvA or SolvB. SolvA: 0.01 mg/mL Tetracosane in 4:1 Chloroform:Methanol. SolvB: 0.01 mg/mL Tetracosane in Chloroform; Saturated with ammonium hydroxide.

Method Parameters:

Instrument: Agilent 7890B GC with Agilent 5977A MS
Column Type and Dimensions: DB5-MS; 15 m long; 250 μm ID; 0.25 μm film thickness
Inlet Temperature: 280 °C
Minimum Injection Volume: 1 μL
Injection Mode: Split
Maximum Split Ratio: 50:1
Carrier Gas and Flow: Helium and 2.0 mL/min
Control Mode: Constant flow
Oven Program Set Points: 280 °C for 0 min; 30 °C/min to 310 °C for 2.5214 min
LTM Program Set Points: 90 °C for 0.1 min; 180 °C/min to 225 °C for 0.3 min; 70 °C/min to 300 °C for 1.3 min
Minimum Run Time: 3.52 min
Detector: See MS_361918 Mass Spectrometry Method Parameters

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound. Earliest eluting compound fulfilled the repeatability and reproducibility acceptance criteria.

Repeatability: Individual retention times measured for representative compounds are within 0.1 minutes of the average of 30 injections.

Reproducibility: Individual retention times measured for representative compounds during 6 weeks are within 0.1 minutes of the values measured on week 1.

SFL8

Method: MS_361918

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (EI)

Scope: General purpose

Sample Preparation:

GC effluent

Method Parameters:

Instrument: Agilent 7890B GC with Agilent 5977A MS
Mass Analyzer: Quadrapole
Ionization Mode: Electron Ionization
Scan Range: 35 - 550 m/z
Scan Rate: 3,125 [N=1]
Source Temperature: 325 °C
MS Temperature: 150 °C
Transfer Line Temperature: 280 °C
Tune Type: standard

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall sample spectral pattern corresponds to that of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum are of the same nominal mass as those in the reference spectrum. The molecular ion is present in the sample spectrum if it is present in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Methods: ATR_361847; ATR_361850; ATR_361923; ATR_361950; ATR_361951; ATR_361975; ATR_361987

Identification of Controlled and Non-controlled Substances by Solid-Phase Infrared Spectroscopy

Scope: General purpose

Sample Preparation:

Sample will be analyzed either by direct analysis, sublimation, or extraction with any appropriate solvent, including but not limited to methanol, chloroform, acetone, petroleum ether, ethyl ether, methylene chloride, water, ethyl acetate, xylenes and hexane, or any combination of these.

Method Parameters:

Instrument: Thermo Scientific, Nicolet iS10 FT-IR
Number of Background Scans: 8 Scans
Minimum Number of Sample Scans: 8 Scans
Scan Range:

- *ATR_361847; ATR_361923; ATR_361850; ATR_361951; ATR_361975; ATR_361987:*
  - 400 cm^{-1} – 4000 cm^{-1}:
- ATR_361950:
  - 500 cm^{-1} – 4000 cm^{-1}

Sample Gain: Autogain
Resolution: 4 cm^{-1}
Optical Velocity:

- *ATR_361847; ATR_361923; ATR_361987:* 0.6329 cm/s
- *ATR_361850; ATR_361950:* 0.3165 cm/s
- *ATR_361951; ATR_361975:* 0.4747 cm/s

Aperture:

- *ATR_361847; ATR_361850; ATR_361950:* Medium resolution
- *ATR_361923; ATR_361951:* Open
- *ATR_361975:* 80.0
- *ATR_361987:* 150.00

Accessory:

- *ATR_361847*: Smart Golden Gate - KRS-5
- *ATR_361850; ATR_361923; ATR_361950; ATR_361951; ATR_361975; ATR_361987:* Smart iTX

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall sample spectral pattern corresponds to that of the reference spectrum and the prominent, well-defined, measured signals in the sample spectrum were all within 4 cm^{-1} of those in the reference spectrum. No prominent extraneous signals are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Method: DART-MS2

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (DART)

Scope: General purpose

Sample Preparation:

Samples can be prepared using organic volatile solvents (MeOH, acetonitrile, acetone, hexane, etc.), D.I. H2O, or the LCMS injection solvent. Powder samples can be directly analyzed (manually) and require no sample preparation (use DIP-it tips or disposable glass capillaries or needles). Items such as tablets, blotter paper, etc. can also be analyzed without any sample preparation.

Method Parameters:

Instrument: IonSense DART ionization source and ThermoScientific LCQ Fleet mass spectrometer.
Mass Analyzer: Quadrupole ion trap (QIT)
Ionization Mode: Direct analysis in real time (DART)
Drying Gas: N/A
Ionization gas: Helium
Capillary Temperature: 200°C
MS Scan Range: 50-500 m/z
MSMS Range: 50-500 m/z (variable based on precursor ion)
MS Scan Rate: 60 µs/u (normal scan)
MSMS Scan Rate: 60 µs/u (normal scan)
Collision Gas: Helium
Collision Energy: 30 V
Tune File: DART Tune.LTQTune
Activation Type: Collision-induced dissociation (CID)

Limitation Summary:
Analysis of mixtures may result in the production of multiple protonated molecular ions during DART ionization. Also, some fragmentation of molecular ions may be observed due to the high temperature of the source.

Under DART-MS2 conditions, analysis of dipyrone does not produce an intact protonated molecular ion. Instead, the degradation product 4-methylaminoantipyrine is observed.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall MS and MSMS fragmentation spectra correspond to those of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum were all of the same nominal mass as those in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Method: GEN1

Separation of Controlled and Non-controlled Substances by Liquid Chromatography

Scope: General purpose

Sample Preparation:

Stock sample solutions should be prepared using MeOH or D.I. H_2O at a target analyte concentration of 0.5 mg/mL. For analysis, the stock solution should be diluted 1:10 using the LCMS injection solvent (0.1% formic acid in D.I. H_2O), then filtered to 0.2 µm.

Method Parameters:

Instrument: ThermoScientific Ultimate 3000 UHPLC with ThermoScientific LCQ Fleet mass spectrometer
Column: Hypersil GOLD C18; 50 x 2.1 mm; 1.9 µm
Column Temperature: 20ºC
Buffer/Mobile Phase: Solvent A: D.I. H_2O with 0.1% formic acid; Solvent B: Acetonitrile with 0.1% formic acid
Minimum Injection Volume: 1 µL
Gradient Set Points: 0-1.0 minute: 95:5 A/B
1.0-4.0 minute: 95:5 to 5:95 A/B
Re-equilibration: 4.0-4.5 minute: 5:95 to 95:5 A/B
4.5-6.0 minute: 95:5 A/B

Flow Rate: 0.400 mL/minute
Detector Wavelength: N/A
Minimum Run Time: 4.0 minutes

Limitations: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Selectivity: Target compounds are visually separated and observed as a single peak with a clear, non-splitting apex. Peak fronting/tailing, if observed, does not preclude the detection of closely eluting peaks. A minimum S/N =3 is observed, including a low level (0.5%) marker compound.

Repeatability: Individual retention times measured are within 0.3 minutes of the average of 30 injections.

Reproducibility: Individual retention times measured during weeks 2-6 are within 0.3 minutes of the values measured on week 1.

SFL8

Method: NESI-MS2

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (ESI)

Scope: General purpose

Sample Preparation:

Stock sample solutions should be prepared using MeOH or D.I. H_2O at a target analyte concentration of 0.5 mg/mL. For analysis, the stock solution should be diluted 1:10 using the LCMS injection solvent (0.1% formic acid in D.I. H_2O), then filtered to 0.2 µm.

For direct analysis using the syringe pump, other solvents like acetone, acetonitrile, ethanol, hexane, etc. are also acceptable.

Method Parameters:

Instrument: ThermoScientific LCQ Fleet mass spectrometer
Mass Analyzer: Quadrupole ion trap (QIT)
Ionization Mode: Negative mode electrospray ionization (ESI)
Drying Gas: Nitrogen
Capillary Temperature: 275°C
MS Scan Range: 50-500 m/z
MSMS Range: 50-500 m/z (variable based on precursor ion)
MS Scan Rate: 60 µs/u (normal scan)
MSMS Scan Rate: 60 µs/u (normal scan)
Collision Gas: Helium
Collision Energy: 30 V
Tune File: LCMS-NEG.LTQTune
Activation Type: Collision-induced dissociation (CID)

Limitation Summary: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall MS and MSMS fragmentation spectra correspond to those of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum were all of the same nominal mass as those in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.

SFL8

Method: PESI-MS2

Identification of Controlled and Non-controlled Substances by Mass Spectrometry (ESI)

Scope: General purpose

Sample Preparation:

Stock sample solutions should be prepared using MeOH or D.I. H_2O at a target analyte concentration of 0.5 mg/mL. For analysis, the stock solution should be diluted 1:10 using the LCMS injection solvent (0.1% formic acid in D.I. H_2O), then filtered to 0.2 µm.

For direct analysis using the syringe pump, other solvents like acetone, acetonitrile, ethanol, hexane, etc. are also acceptable.

Method Parameters:

Instrument: ThermoScientific LCQ Fleet mass spectrometer
Mass Analyzer: Quadrupole ion trap (QIT)
Ionization Mode: Positive mode electrospray ionization (ESI)
Drying Gas: Nitrogen
Capillary Temperature: 275°C
MS Scan Range: 50-500 m/z
MSMS Range: 50-500 m/z (variable based on precursor ion)
MS Scan Rate: 60 µs/u (normal scan)
MSMS Scan Rate: 60 µs/u (normal scan)
Collision Gas: Helium
Collision Energy: 30 V
Tune File: LCMS.LTQTune
Activation Type: Collision-induced dissociation (CID)

Limitation Summary: See individual instrument validation reports.

Acceptance Criteria (unless otherwise noted in individual validation report):

Accuracy: Analyte spectra are compared to a verified reference database, commercial library, published literature spectra or spectra from another ISO/IEC 17025 accredited laboratory. The overall MS and MSMS fragmentation spectra correspond to those of the reference spectrum. The measured m/z values for prominent ions in the sample spectrum were all of the same nominal mass as those in the reference spectrum. No prominent unexplainable extraneous ions are observed in the sample spectrum.

Repeatability and Reproducibility: The repeatability and reproducibility of confirmatory methods is established via evaluation of system-wide historical spectral data.