

STANDARD OPERATING PROCEDURE

[Gas Chromatography Mass Spectrometer – SPME]

Doc No. GC-SPME-1.1

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Instrument: GCMS

Brand/Model: Shimadzu/GC(QP2010) MS

Software: GCMSsolution

1. INTRODUCTION

Gas Chromatography Mass Spectrometer (**GCMS**) is an analytical technique for detection of organic compounds (analytes). GCMS utilizes two chemical analysis techniques including compound separation by chromatography and identification by Mass Spectrometry (MS).

Solid Phase Micro Extraction (SPME) is a gas extraction technique where a coated fiber extracts compounds from a gas sample, which are then thermally desorbed into the GC column.

Analyte compounds should have low molecular weight (less than 600 Dalton) and be volatile at a temperature less than 300 °C. The compounds are fragmented in MS and identified by matching a mass database.

2. SCOPE

The scope of this standard operating procedure (SOP) outlines the safe use and operation of the instrument by following an established method.

This is considered a low risk item.

Users shall follow "SOP_GCMS_Sh_Adv01" for modifying GC or MS conditions.

3. REQUIREMENTS

3.1 Roles and responsibilities

Instructor is a TrACEES Platform staff who has the adequate expertise and training responsibility for the instrument.

Instrument supervisor is the Platform staff who is responsible for maintenance and troubleshoot.
Operators (or Users) are any internal (incl. the University's students and staff) and external personnels.

3.2 Personal Protective Equipment (PPE)

Laboratory coat, safety glasses, fully covered footwear, gloves when handling toxic materials.

3.3 Training and Induction

Prerequisites TrainMe Modules:

PPE, Laboratory Safety, and Chemical Management.

All users shall complete a local lab induction and be trained by the instructor.

Users from Schools/Department other than School of Chemistry shall also complete a building induction.

4. WARNINGS

- Hot surface of the injection port
- Ensure the sample height is less than 1cm (10mm) from the bottom of the vial

5. OPERATION

5.1 Start Up

5.1.1 Open GCMS Real Time Analysis software

On the computer's desktop, double click on  icon. When prompted with login window, leave "Admin" as default username with no password, click "OK".

5.1.2 Open Cycle Composer software

On the computer's desktop, double click on  icon. This software controls the autosampler.

5.1.3 Load sample vials

Ensure **the sample height is less than 1cm (10mm)** from the bottom of the vial

Load sample vials in Tray 2 (HS-vials) into the appropriate vial holder numbers (1 – 32).

5.2 During Operation

GCMS setup

5.2.1 Go to GCMS Real Time Analysis software

5.2.2 Open project folder

Under “File” in Menu bar, click “Select Project(folder)”.

5.2.3 Load a previous sample list

The instructor should create a sample list template for the operator.

Click open button  to load pre-existing sample list as batch file (*.qgb).

5.2.4 Name samples

Give each sample an appropriate name under the Sample Name column.

5.2.5 Load GCMS methods

The instructor should create GCMS methods based on the user’s project.

In Column “Method File”, use  button to load the desired GCMS method (*.qgm).

5.2.6 Enter data files

Data files should be unique for each sample. Operators must ensure data files will not overwrite each other.

Suggested format “[YYMMDD]-[Operator Initial]-[Sample]”, e.g. “231120-AD-sample1”

Do Not use “space” or any special characters.

Click Save batch files under File tab.

Autosampler

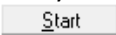
5.2.7 Go to Cycle Composer software

Create an identical sample list to the one in GCMS Real Time Analysis software, ensuring the sample order matches.

Choose the desired injection method under Method column by using  button to browse pre-existing method.

Enter “Tray2” under tray column and the corresponding vial numbers under Vial column e.g., 1.

5.2.8 Press the start button in GCMS Real Time Analysis software. Then press the start button

 in Cycle Composer software.

5.3 Shut Down

The instrument shutdown is not required.

5.4 Clean up

Users should remove all sample vials from the holder at the completion of their session, and dispose of them in their own labs.

5.5 Data transfer

Users shall not bring and use own data storage device such as USB sticks.

Mediaflux Data Mover is the preferred method.

6. MAINTENANCE/TROUBLE SHOOTING

Operators shall keep the working area clean and tidy.

Operators are not required for instrument maintenance and trouble shooting.

Contact the instrument supervisor for any equipment related issues.

7. INCIDENT/EMERGENCY

7.1 Incident

In the event of a minor incident (spill and cuts), operators shall report to the instrument supervisor or lab manager immediately.

Chemical spills: users shall use spill kit and follow clean up procedure.

Any contact with chemicals, wash the area immediately, and use emergency showers or eyewash for more serious incidents.

Minor cuts: use first aid kits properly if needed.

First aid assistance shall be provided by the area’s first aid officer.

7.2 Emergency

In the event of a major incident/emergency (fire, explosion, medical emergency), operators shall:

- Notify the relevant emergency response department e.g. Fire, Ambulance, Police (dial “000”).
- Notify the School of Chemistry OHS Coordinator (03 90355494)

8. REFERENCES

8.1 Legislation

Occupational Health and Safety Act 2004

Occupational Health and Safety Regulations 2007

8.2 Codes and Standards

AS/NZS 1337.1-2: Personal eye-protection

AS/NZS 1337.4-6: Eye and face protection

AS/NZS 2161 (Series): Occupational protective gloves

8.3 University Procedures/Guidance

The equipment is not considered as Regulated Plant.

See OHS’ Regulated Plant Requirements

(<https://safety.unimelb.edu.au>)

