

	TRACE-PM 7.7 Gas Chromatography - Mass Spectrometer	
	Document #: 7376	Page 1 of 2
	Revision #: 3	Issued Date: 09/02/2020
	Document Manager: Cheryl Lozen	Approved By: Ryan Larrison

7.7 Gas Chromatograph - Mass Spectrometer (GC-MS)

Note: The sub-discipline specific procedures may contain further minimum standards and controls for that analysis type.

Calibration is the process used to ensure mass accuracy.

Tuning is the process used to make sure that the instrument is working well for a particular sample.

Instrument tunes can vary from full calibration and tuning to checking the current calibration and tune results, depending on the capabilities of the instrument and the needs of the process.

Full calibration and tuning will be performed by, or in conjunction with, the Instrument Technician at least once per year, after any maintenance of the MS, and if the weekly tune check does not pass.

A tune report showing the calibration and tune results will be prepared and checked:

- 1) after full calibration and tuning, and
- 2) on a weekly basis, or prior to casework if casework is done less frequently than weekly.

The tune check passes if the peaks are centered over the correct mass reading on the tune windows; the 69 m/z peak has 100% abundance; the 219 m/z peak has greater than 30% relative abundance; the 502 m/z peak has greater than 1%; the peaks have a bell-shaped curve; and all diagnostic checks within the tune report successfully pass.

If the tune does not pass, the instrument must be taken out of service until the problem is corrected. In the event that the instrument is not functioning properly, the unit supervisor or a designee must be notified and the instrument clearly labeled to indicate that it is out of service (for instance, a sheet of paper with the words "Out of Service" can be placed over the monitor). After the instrument has been repaired, the label can be removed.

Function Verification:

On any day the GC-MS is used, a function verification sample shall be injected into the instrument and the chromatogram and spectra obtained. The volume and concentration of the sample and the gas chromatograph and mass spectrometer operating parameters should be consistent on a day-to-day basis. To detect trends, visually compare to previous runs. The retention times should not change appreciably on a daily basis and the spectra obtained should be of acceptable quality. The spectra obtained will demonstrate that the instrument is producing acceptable spectra and will be an indicator of the sensitivity of the instrument. If the quality of the spectra is not sufficient, the instrument should be tuned and the function verification repeated.

Detecting Trends

	TRACE-PM 7.7 Gas Chromatography - Mass Spectrometer	
	<i>Document #: 7376</i>	<i>Page 2 of 2</i>
	<i>Revision #: 3</i>	<i>Issued Date: 09/02/2020</i>
	<i>Document Manager: Cheryl Lozen</i>	<i>Approved By: Ryan Larrison</i>

The once per week maintenance tune results are compared to the tune made by the instrument technicians after their most recent service of the instrument. The daily standard (ASTM Test Mix or other selected standard) data is compared to previous standard data obtained after the last maintenance tune by the instrument technicians. Each weekly maintenance tune, the instrument technician's tune and the daily standard run made after their tune are kept in a file on the GC-MS computer (desktop) and can be examined to detect trends. Instrument issues, servicing instances and/or repairs are recorded in a logbook kept with the instrument.

Documentation:

Documentation is to include maintaining the hard or electronic copies of the tunes of the instrument and the data obtained for its function verification.