

With a view to achieve wide choice of models and applications of the GC-MS and HPLC systems, following addenda are issued which may be read along with the technical specifications already issued vide reference no. TU/FIN/FIST-NER/198/09 dated 07.09.2009.

Addendum to Technical Specification for GCMS SYSTEM

Gas Chromatograph specification:

A fully automated gas chromatograph with programmable or electronic pneumatic control Multi-tasking operational system. All temperature and time functions to be microprocessor-controlled and to be shown on the touch-screen display or Large LCD display. Intuitive menu and cursor driven user interface with on-screen help. Gas Chromatograph to supports up to 2 injectors (PTV/POC & Programmable split/splitless) with Programmable or Electronic pneumatic/Flow Controls. Gas Chromatograph to supports at least 2 Programmable Pneumatic Control Detectors

Oven : The system should be flexible enough to support complex multi-valved, multi-column, multi-detector configurations.

- a. Temperature range : 4⁰C above ambient to 450⁰C, with cryogen: -99⁰ C to 450⁰ C
- b. Maximum programmable ramp rate : minimum 120⁰ C/min or better
- c. Cool-down Rate : 450 °C to 50 °C is less than 3 minutes

Injectors: Maximum provision for 2 (two) operating injectors with Programmable/Electronic Flow Control, capillary columns from 1 to 250 m. length. Injector should have one autostart switch to automatically activate runs by the syringe so that every run starts immediately when sample is injected.

Programmable Split/Splitless Capillary injector:

Temperature-programmable inlet

At least three-ramps temperature program

Oven-tracking mode for simple operation

50 °C to 500 °C in 1 °C increments or better

Heat-up rate of 1 °C/min to 200 °C/min or ballistic

Large-volume injection of up to 50 µL with autosampler, 150 µL manually

Split ratio easily adjustable for a wide range of analysis conditions

Three choices of liner available: 1-mm and 2-mm i.d. and on-column

Charcoal trap in split vent prevents contamination of split valve and lab air

Programmable pneumatics – programmed flow, programmed pressure, programmed velocity or constant flow. Vacuum compensation software selectable

Programmable on-column capillary injector or Programmable Temperature Vaporizing (PTV) injector:

Temperature-programmable inlet

Three-ramps temperature program
Oven-tracking mode for simple operation
50 °C to 500 °C in 1 °C increments
Heat-up rate of 1 °C/min to 200 °C/min or ballistic
Programmable Pneumatics include readout which displays pressure and column flow.
Semipreparative column and trap system for collection of material (s).
Column of different polarity:
PEGA, SE, OV, DEGS and Carbowax

Autosampler for GC-MS :

Consists of minimum 80 vial (2mL) plus one priority capacity carousel,
Minimum 80 x 2ml vials with caps & septa, wash station for 3 solvents, 4x solvent wash bottles, caps, septa, one waste vial
Syringe size 0.5 µL, 5.0 µL, 50.0 µL, 100 µL or 500 µL,
Viscosity settings 0-15 minimum
Minimum sample 5 µL when used with the 0.25-mL vial insert; 350 µL when used with the 2-mL vial
GC Ethernet communications interface with TCP/IP protocol for workstation control.
Seven
External Powered Events, Run Time diagnostics.
Computer to serve as GC/MS data station with latest configuration.

The software for GCMS should be Windows 95, 98 NT, 2000 and XP compatible.
Workstation software should be multitasking system controlling all GC and MS
Modules like SIS/SIM, Full Scan etc.

Compatible to Standard Spectral Databases like NIST, Wiley etc

Low Bleed MS Fused Silica Capillary Columns: to be quoted

Mass Spectrometer

Analyzer: Quadrupole with prefilter or Ion trap
Vacuum Pump: Electron ionization (EI) and chemical ionization (CI) with minimum 250 L/sec Turbomolecular pump to provide a vacuum of approx. 10^{-6} Torr in the manifold.
Mass stability ± 0.1 m/z mass accuracy over 48 hours or better over the entire range
Detector Sealed long-life photomultiplier or Electron multiplier
The Mass Spectrophotometer must have time programmable EI, PCI, NCI capabilities.
All component of the system must be under computer control
The mass ranges 1.0-1500 u (amu) amu or better programmable throughout the analysis.
Scan rate: Fully variable upto minimum 10000 amu/sec or better
Ionisation mode includes EI, PCI, NCI, SIS/SIM (Selected Ion Storage/Monitoring)

The system must offer programmable control from one mode of operation to another within a single analysis, without any hardware change.

Sensitivity EI: 1 pg of octafluoronaphthalene in hexane, 150:1 RMS or better

Sensitivity: Positive CI full scan 100 pg of benzophenone 250:1 RMS or better

Negative CI full scan 1 pg octafluoronaphthalene 4000:1 RMS or better

Change over between EI and CI must be possible during the single run.

NIST 2008 MS Library and Search Programme. Selected ion storage facility capable of simultaneous storage of ions and library searchable against standard library like NIST.

Transfer line temperature: independent control, 350°C

Power fail protection: in case of power failure during run, full protection should be available to protect the capillary column from damage.

Accessories of GCMS:-

Computer and Printer:

PC and Printer with Software

Pentium – IV, 2GHz 2GB RAM, 120 Hard Disk,
DVD Comb Drive, 17" TFT Monitor, USB ports,
105 keys Keyboard, Scroll mouse, Original
Windows XP Service Pack 3 Software,
Color laser Printer

UHP Helium, Hydrogen, Nitrogen, Zero Air Gas Cylinders.

Double Stage Gas Regulator for Gas Cylinders

Addendum to Technical Specification for Analytical and Preparative HPLC System

No. Description Qty

1. Quaternary Analytical Pump

Flow Rate Range : 100 – 10,000µL/min

Flow Rate Accuracy : +0.1% at 1 mL/min

Flow Rate Precision : < 0.1% RSD

Pressure range : 0 to 6200 psi for the entire flow-rate range

Compositional Accuracy: + 0.5% from 3 to 97% up to 5mL/min or better

No. eluent lines : 4

Gradient Forms : Linear, exponential 1 to 9.9 (+/-) or step (80 profile) or better

No. Description Qty

1. Binary Analytical Pump

Flow Rate Range : 0.5-50 mL/min

Flow Rate Accuracy : +0.1% at 3 mL/min

Flow Rate Precision : < 0.1% RSD

Pressure range : 1 – 10 MPa (1450psi)

Pressure ripple : typical : < 2 bar or < 1.5 %

Proportioning Accuracy : +0.2% at 5 mL/min

No. eluent lines : 2

Power Cord India Version,

3 vacuum degasser channels

Manual Injection Valve Kit, analytical

Manual Injection Valve Kit, semi preparative

Variable Wavelength UV-VIS Detector

Detection Type : Double beam forward optics design

Wavelength Range : 190nm to 700 nm or better

Wavelength Bandwidth : 5 nm or better

Noise : < +/- 0.75 x 10⁻⁵ AU, 210-280 nm, 2 sec. response or better

Drift : < 1 x 10⁻⁴ AU/hour, after warm-up or better

Light Source : Deuterium (190-360 nm) or Tungsten (360-700 nm) prefocused-no adjustment required on replacement.

Linearity : Up to 2.5 AU

Analytical flow cell, 12 µL, SST, 10mm Path

C-18 Analytical Column, 5 µm, 4.6 mm x 250 mm 2

C-18 Guard Column, 5 µm, 4.3mm 2

Guard Holder and Coupler Kit 2

Semi Preparative Columns, RP – C18 and others HPLC columns

Normal phase analytical CDS column

Semi Preparative column for Normal phase HPLC column

PC and Printer with Software:

Pentium – IV, 2GHz 2GB RAM, 120 Hard Disk,

DVD Comb Drive, 17" TFT Monitor, USB ports,

105 keys Keyboard, Scroll mouse, Original

Windows XP Service Pack 3 Software,

Color laser Printer 1