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Appendix -II

Technical Specification of GCMS System

The Single Quadrapole GCMS with the following features to deliver high performance operation, maximum sensitivity, maximum uptime, and maximum productivity. Systems should have three years comprehensive warranty for GCMS along with all local supplies.

Gas Chromatography system

The front end Gas chromatograph system should be capable of delivering advance separation capabilities and real time self monitoring intelligence to provide superior performance for all MS applications. The Gas Chromatography system supporting the MS should have the following features for enhanced quantification/qualification capabilities.

- The system should have an Autosampler/injector with vial capacity of 15 vials or more. The system should be upgradable to 100 vial or better capacity.
- Autosampler should be capable of handling large volume injection upto 50 uL or better
- Autosampler should be upgradable with bar code reader, dilution , vortex, heating and cooling capability
- Advanced electronic flow control modules with Pressure set points adjustable in increments of 0.01 psi, with typical control ± 0.001 for the range 0.000 to 99.999 psi
- User may select pressure units as psi, kPa or bar
- High performance GC oven temperature control from ambient temperature +4 °C to 450 °C.
- GC Oven Should support 15 oven ramps with 16 plateaus or more, Negative ramps should be allowed
- System should have Gas saver mode to reduce gas consumption without compromising performance.
- Maximum achievable temperature ramp rate should be 100 °C/min
- Atmospheric pressure and temperature compensation is standard, so results do not change, even when the laboratory environment varies
- The system should be provided with Programmable Large Volume Inlet for wide range of capillary column (50, 100, 250, 320 microns) having a heating rate of 800 degree/min or better and should be programmable.
- FID should be quoted with the system
- Split/Spitless inlet

Single Quadrapole Mass Spectrometer with EI:

- One split flow turbomoleculer vacuum pump of capacity 250 litres/sec or better for creating high vacuum.
- Rotary vane fore line pump supporting the turbomolecular pump
- Quadrapole should be made up of inert material with hyperbolic shape to have better mass transfer efficiency
- The analyzer should have suitable inbuilt feature to keep it clean from dirty matrix preferably heated quadrupole.
- The system should have facility to use Hydrogen as carrier gas to reduce cost of operation
- System should have Electron multiplier detector with long life and better sensitivity

- The system should have independently heated GC/MS interface
- Mass range (m/z) upto 1,000 amu or better
- Resolution Unit mass
- Scan rate (electronic) of 12000 u/s or better
- Non coated inert EI source
- Ion source temperature upto 350 °C or better
- Should have software controlled Auto tune or manual tune to enable quick start up for quantitative analysis.
- The sensitivity of system should be as followed and demonstrated at site:
  EI Scan S/N 1 µL of 1pg/µL of OFN will produce > 550:1 or higher
  EI SIM IDL 30 fg or less with 8 sequential 1 uL injection of 100fg/uL OFN Standard

Software Control System

WorkStation Instrument Control software allows you to perform the following tasks:

- Start and stop the instruments from the software
- Download settings to the GC and the Single Quad in real time to control the instrument
- Evaluate if the MS parameters are within the limits to produce the specified mass accuracy and resolution with a Check tune report
- Optimize MS parameters automatically or manually through software tuning programs and print an Auto tune report
- Monitor the actual conditions of the instrument
- View the real-time plot for chromatograms and instrument parameters (both GC and MS) and print a real-time plot report

Quantitative analysis- Qualitative analysis Features

- Imports information directly from the acquisition method
- Provides a curve-fit assistant to test all fits and statistics on curve quality
- For fast method development, this software is used to quickly review the qualitative aspects of the data, such as the optimum precursor to product ion transitions.
- Qualitative Analysis program to present large amounts of data for review in one central location.
- Extract chromatograms
- View and extract peak spectra
- Subtract background
- Integrate the chromatogram
- Find compounds

Library:

NIST 2014 library with license to be supplied with the system. Fatty acid library, pesticide library and flavor & fragrance library to be supplied separately. A metabolite spectral database of at least 1000 compounds should be supplied with the system

Accessories:

All Gas Cylinder with Double Stage Regulators, Gas Purification Panel, Suitable Columns, 5 Kva online UPS with 30 Min battery back up to be included with the offer and Laser printer also to be included in scope of supply.

System should be supplied up to NIT Manipur by vendors.