

TECHNICAL SPECIFICATION

LIQUID CHROMATOGRAPH MASS SPECTROMETER

LCMS/MS Should be bench top **triple quadrupole mass spectrometry** coupled with liquid chromatography for high sensitivity trace level quantitative analysis with following specifications:

1. Mass Spectrometer	<p>1. The API interface should be simple without complex aperture and able to handle large batch of samples.</p> <p>2. Should have rugged ion source.</p> <p>3. It should not have any fused silica/quartz/glass/dielectric capillary tubes to transport ions in to the mass analyser</p> <p>4. Source should be cleaned while maintaining the vacuum.</p> <p>5. The system should be quoted with dedicated separate ESI and APCI probe. The ESI probe should be capable to handle flow rate up to 2ml/min. and the APCI should handle flow rate up to 2ml/min. APCI source should be supplied with ESI/APCI .</p> <p>6. The ESI/APCI must have desolvation temperature up to 500°C or better</p> <p>7. The mass spectrometer must operate in mass range from 10-2000m/z or better</p> <p>8. MS/MS sensitivity (MRM) have performance specification should be installation specification as per below:</p> <p style="padding-left: 20px;">ESI+ Sensitivity: 2ul loop injection of a 500fg/ul (total injection of 1pg/ul) reserpine solution at a flow rate of 300ul/min methanol/water should produce a minimum S/N ratio of 50000:1 for the transition of the protonated molecular ion at m/z 609.3 to the fragment ion at m/z 195.1 when operated in selected reaction monitoring mode (SRM) with Q1 and Q3 resolution set to 0.4 and 0.7Da FWHM, respectively</p> <p style="padding-left: 20px;">ESI – Sensitivity: 2ul loop injection of a 2500fg/ul (total injection of 5pg/ul) of chloramphenicol solution on column at a flow rate of 300ul/min methanol/water should produce a minimum S/N ratio of 1000:1 for the transition of the protonated molecular ion at m/z 321 to the fragment ion at m/z 152 when operated in selected reaction monitoring mode (SRM) with Q1 and Q3 resolution set to 0.4 and 0.7Da FWHM, respectively</p>
2. Collision Cell:	The collision cell should be able to reduce the chemical background noise and increase effective S/N ratio should be able to perform 500 SRM/sec with zero cross talk and no loss in sensitivity
3. Dwell Time:	The system should have minimum dwell time of 1ms.
4. Resolution	Should be better than unit mass i.e. 0.75Da FWHM for quantitative scan also should have facility for higher resolution up to 0.5Da FWHM
5. Scan Speed	15000 amu/sec or more
6. MRM Transition	500 SRM/Sec (1ms dwell/1ms inter channel delay) without loss of sensitivity and the instrument must have ion polarity switching in less than 30 ms
7. Dynamic Range	System should have 5 orders of magnitude or better dynamic range
8. Divert Valve	The divert valve must be under fully automated data system control. The divert valve must enable user to switch the solvent front, gradient end point and any other portion of the HPLC run to waste. Allow user to define the default state of the valve and change state in time segments
9. Syringe Pump	The mass spectrometer must have total syringe pump control to allow for automated infusion under data system control. The data system must be capable of switching on and off the syringe pump in time segment.
10. Data System	Must include instrument control and processing software, quantitation package, quality browser, dedicated toxicology ID software with library.
11. PC	Branded computer with Windows software minimum 1.22GHz processor, 3GB RAM, 350GB HDD, 3GHz speed with 19" monitor with multitasking capabilities.
12. Scan Functions	Must acquire and display full scan mass spectra from Q1 and Q3, selected ion monitoring (SIM) scan data, full scan product ion and precursor ion spectra, full scan neutral loss ion spectra, selected reaction monitoring data (SRM/MRM) .
B) HPLC System	Ultra Fast High Pressure Liquid Chromatography System
1. Pump	Quaternary gradient pump preferably with four channel vacuum degasser. Operating flow rate range 0.010 to 2.000ml/min with flow rate accuracy of ±1%. Pump back pressure 15000 psi or better, flow precision of <0.075% RSD or <0.01 min SD whichever is greater.

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2. Auto sampler	Should have a minimum sample capacity of (90 or More) x 1.5 to 2 ml vials capacity or more and can accommodate 96/384 well plates. Injection volume range of 0.1 to 100ul with minimum increment volumes and injection volume accuracy of $\pm 1\%$. 20ul,250ul and 1000ul loop must be quoted if available. Auto sampler carry-over should be $\leq 0.005\%$ with Proper cooling system to maintain 4 degree centigrade.
3. Column Compartment	Thermo stated Column compartment should hold minimum 2 column with temperature range from 5°C above ambient to 90°C.
4. PDA/DAD Detector	Wavelength range: 190 – 800 nm Light source: Prealigned Deuterium lamp for UV range Analysis Tungsten (W) lamp for Visible Range Analysis Data acquisition rate: 80 Hz or more Wavelength accuracy: +/- 1nm No of Photo diodes: 512.
5. Software	The single point software of LC and MS of same vendor.
6. Columns	C-18: 6 No (100mm X 4.6mm, 5micron, 100mm X 2.1mm , 3 micron or Less , 50mm X4.6mm , 3 micron or Less , C-8: 2 No, and 2no other suitable column for pesticide analysis .Should be supplied with guard columns. C 30 Analytical Columns (150mm X 4.6mm, 3micron) with Guard Column with holder, column for Vitamins .

LCMS/MS should be supplied with Accessories:

1. Nitrogen Generator (1 No), - **PEAK Scientific**
2. Ultrasonic Bath (5Ltr) imported, - **Branson or equivalent**
3. Sample and Solvent Filtration Kit- Aqueous and Non Aqueous,
4. Syringes -500microlitre - 2Nos, **Hamilton**
5. Argon Cylinder with regulator(2 Nos), - **BOC gases or equivalent**
6. Gas manifold with Gas purification Panel.– (**Imported**)
7. Deep Freezer: -20degC (2Nos) 300Litres or more capacity (**Imported**)
8. Deep Freezer :-40 degree C(1No) 300Litres or more capacity (**Imported**)
9. Double Door Refrigerator- 2No -(**LG, Samsung, Hitachi or equivalent**)
10. Ultra Pure Water Purification System – From Tap Water to Ultra pure(Millipore, Thermo, Elga or Equivalent),
11. Bench top PH Meter(0 -14, 0.001, 3point calibration)(**Mettler, Sartorius, Metrohm or equivalent**)
12. Double Distil Glass Distillation Assembly (**indigenous**),
13. Dessicator - **Indigenous**,
14. On line UPS for full system (Minimum 20 KVA) with **60 Minutes** of Back up (**Uniline, Jackson or equivalent**)
15. **1.5 ton Air conditioner** five star rated with stabilizer should be provided.-2 Nos - (**LG, Samsung, Hitachi or equivalent**)

Other Terms & Conditions:

1. Manufacturer of Equipment & Accessories should be ISO 9001 / ISO 13485 certified.
2. Equipment and Accessories should be US FDA / European CE certified by Notified Body.
3. **Guarantee:** Three years on equipment, accessories and all peripherals / sub systems from the date of installation, which Includes 4 visits and unlimited breakdown calls by service/application support engineer during the Guarantee period.
4. Basic training for a period of not less than **two weeks** after installation of the equipment to technical personnel includes Operational & Trouble shooting training as and when required.
5. Manufacturer should provide an Training Instructor for initial 6 month (minimum) to train on duty staff and after 6 month as per demand of user department as an when required.
6. Installation will be done by supplier free of cost including all parts like wires, tubes, joints & attachments, small fixtures etc.
7. **Firm should mention all the pre-installation requirements in technical bid.**
8. Technical Compliance statement should be submitted in Technical Bid Documents, along with every above mentioned point should be submitted with relevant literature, specification sheets and brochures. Any deviation from specifications should be clearly mentioned in compliance statement.
9. **Comprehensive Maintenance Service: The CMC may be awarded for five years (on yearly basis) after Guarantee period of three years. CMC should be quoted in BOQ inclusive of Excise Duty & exclusive of VAT/CST etc.) plus service tax (as applicable) .**
10. Manufacturer should provide SOP, I.Q & O.Q etc. as per System requirements.
11. **QuEChERS for fruits and vegetable, pulses and food grains, milk and butter etc. should be provided 10 Boxes (Contains Minimum 50 No's) along with Instruments.**

Manufacturer should provide HPLC Chemicals along with Instruments as per below mentioned:

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LIST OF HPLC CHEMICALS

Sr.No.	chemicals Name	HPLC grade	Quantity
1	N-Hexane	Do	500ml X 6
2	Hexane	Do	500ml X 6
3	ACN	Do	500ml X 6
4	Acetone	Do	500ml X 6
5	Methanol	Do	500ml X 6
6	Dichloromethane	Do	500ml X 6
7	Isooctane	Do	500ml X 6
8	Chloroform	Do	500ml X 6
9	Isopropanol	Do	500ml X 6
10	Acetic acid	Do	500ml X 6
11	MSG	AR grade	smallest pack
12	Aspartame	Do	smallest pack
13	Acesulfame potassium	Do	smallest pack
14	caffeine	Do	smallest pack
15	Piperine	Do	smallest pack
16	Neotame	Do	smallest pack
17	Sucralose	Do	smallest pack
18	Saccharine sodium	Do	smallest pack

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