

Technical Specification

ICP-MS Spectrometer (Inductively Coupled Plasma Mass Spectrometer)

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A Computer Controlled bench top ICPMS Spectrometer is required for **Heavy Metal** / Toxicological analysis having following minimum specifications

1. Sample Introduction system	Sample Introduction Kit including Spray Chamber Peltier Cooled (Temp Range -5 to 20 Deg C), Low Flow Concentric PFA Nebulizer —(2No's) or Equivalent Kit System as per quoted system requirement.
2. Ion Source and RF plasma:	<ol style="list-style-type: none"> 1. Computer controlled 40/27 MHz RF generator operating from 500 to 1600 watts for automatic control of torch ignition, shutdown, and system warm up. 2. The RF Generator and load coil should have suitable cooling facilities as per system requirement. 3. Plasma ignition shall be accomplished without having to move the torch from the analytical position 4. The system should have facilities to prevent the secondary Discharge from the cone Interface with suitable technology. 5. All the elements like Na, K, Fe, Ca, Mg shall be run in hot plasma conditions and it shall be analyzed in single run with hot plasma conditions for all the elements of periodic table. 6. The system shall be with auto dilution facility or electronic dilution so that higher conc. elements upto 10000 PPM and trace level elements are analysed in single run.
3. Ion Extraction Interface:	Standard large orifice Ni sampling and skimming cones with suitable diameters. Pt Sample and Skimmer cones should also be quoted
4. Ion Focusing System:	<ol style="list-style-type: none"> 1. The system shall use suitable device to remove unwanted particle like photons neutrals without causing deposition inside the spectrometer. 2. The Cone Geometry & the Ion deflector shall be removing all neutrals & Photons from the Ion path keeping the Cell (collision & reaction) as also entire Analyzer inside the vacuum chamber.
5. Cell Technology	ICP MS shall incorporate a Cell offering three modes of operation: Standard Mode, Collision Cell Mode with KED and Reaction Cell to utilize a wide variety of gases (including 100% pure reactive gases such as H ₂ , oxygen, CH ₄ , in the single run.) The switching of reaction and collision gases will be through software and automated.
6. Quadrupole Assembly	The quadrupole mass filter shall preferably of material with excellent coefficient of thermal expansion properties. The Mass range should be from 4-250 amu or more Scan speed/ Data acquisition : 3000 amu/sec or better
7. Ion Detector Assembly	<ol style="list-style-type: none"> 1. The ion detector should be a simultaneous dual-stage discrete dynode electron multiplier, and allows element concentration calibration over a full 9 order or more magnitude of dynamic range in a single scan using both analog and pulse ion counting mode, and is protected against overload in both pulse counting and analog counting mode. 2. The dual-stage detector assembly must come standard with the system. 3. The data acquisition/scan speed rate should be 3000 amu/sec. or more.
8. Vacuum System:	Three stage or better differential vacuum system & in the event of power failure, either high vacuum is maintained or the entire vacuum system is to be automatically back-filled by inert gas to preserve the cleanliness of the system.
9. Sensitivity	Guaranteed sensitivity specifications will be considered: Typical sensitivity values will not be considered Sensitivity(MCPS/PPM): 50 or better for Li, 200 or better for In 250 or better for U Oxide ratio (%) CeO/Ce <2.5 or better Ba ⁺⁺ or Ce ⁺⁺ / Ba or Ce <3 or better Background on-mass (cps) No gas <1 Short Term Stability <3% RSD or better Long Term Stability <4% RSD or better

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10. System Controller and Operating System:	Suitable Data Station with all Software controls & future upgrade controls with Instrument software. Software should provide comprehensive functionality and ease feature with simplified auto tuning, Preset of methods.
11. Accessories and Standards:	Re Circulating Chiller along with 5 ltr of Coolant if applicable Sample and Skimmer Ni Cones additional - 2 sets Fume hood with accessories. On line UPS for full system (Minimum 20 KVA) with 60 Minutes of Back up Argon Gas Cylinder – 2 no's , Helium Gas Cylinder – 2no. Reaction Gas Cylinder like Amonia , H2 , Oxygen and methane – 2 no. each SS Material Gas Regulator for all the gases mentioned above – 1 no. each Vendors to provide training at their application laboratory in India for two scientists (If required by User)
12. Computer Configuration	Branded HP/Dell Personal Computer having following configuration: • 500 GB HDD, Latest Processor, 4 GB RAM, TFT-LED 21" Monitor, DVD writer, Optical Mouse, 10 usb port, Keyboard, Serial Port-2, Suitable Licensed Windows 7 O/S loaded, Latest Laser Jet duplex color printer.
Upgradeability	System should be capable to be attached with LC, GC & IC in future
Auto sampler	Auto sampler of more than 300 samples capacity

Accessories:

- Oven - 300deg C or more (**Indigenous- Digital**),
- Muffle Furnace: 1500 deg C or more (**Indigenous- Digital**),
- Shaking Machine, Stirrer(**Indigenous**),..
- Suitable Flexible Fume Hood (Imported),
- Argon Cylinders (4No) with SS regulators (2no), (**BOC gases or equivalent**)
- Gas manifolds with Gas purification Panel.. (**BOC gases or equivalent**)
- Suprapure or equivalent grade HNO₃, HCl, HF etc.
- Element free water- 5 x 1Ltr.**
- Multi element standard—as per scope/elements to be analysed.
- 1000 ppm Gold, Sr, Y single element .
- 1.5 ton Air conditioner** five star rated with stabilizer should be provided.-2 Nos - (**LG, Samsung, Hitachi or equivalent**)

Other Terms & Conditions:

- Manufacturer of Equipment & Accessories should be ISO 9001 / ISO 13485 certified.
- Equipment and Accessories should be US FDA / European CE certified by Notified Body.
- 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.
- 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.
- Manufacturer should provide a 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.
- Installation will be done by supplier free of cost including all parts like wires, tubes, joints & attachments, small fixtures etc.
- Firm should mention all the pre-installation requirements in technical bid.**
- 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.
- 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) .**
- Manufacturer should provide SOP , I.Q & O.Q etc. as per System requirements.
- CRMS (Reference Metal standards) should be provided as per Below mentioned for Analysis :**

Sr. No	Name of Standards
1	Silver (as Ag) 100 ppm
2	Magnesium (as Mg) 100 ppm
3	Calcium (as Ca) 100 ppm
4	Sodium (as Na) 100 ppm
5	Arsenic (as As) 100 ppm
6	Chromium (as Cr) 100 ppm
7	Cadmium (as Cd) 100 ppm
8	Mercury (as Hg) 100 ppm
9	Lead (as Pb) 100 ppm
10	Selenium (as Se) 100 ppm
11	Nickel (as Ni) 100 ppm
12	Antimony (as Sb) 100 ppm
13	Barium (as Ba) 100 ppm
14	Zinc (as Zn) 100 ppm

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15	Copper (as Cu) 100 ppm
16	Manganese (as Mn) 100 ppm
17	Borate (as B) 100 ppm
18	Tin (as Sn) 100 ppm
19	Methyl Mercury (as Hg) 100 ppm
20	Iron (as Fe) 100 ppm
21	Potassium (as K) 100 ppm

12. Manufacturer should provide Chemicals required for Testing of Heavy Metals along with Instruments as per below mentioned :

Sr. No	Name of Chemicals	Qty
1	Nitric Acid ICP grade	500 ml*10
2	Hydro chloric Acid ICP grade	500 ml*10
3	HClO4 ICP grade	500 ml*2
4	HF ICP grade	500 ml*2
5	Sulphuric Acid ICP grade	500 ml*5
6	Acetone ICP grade	500 ml*5
7	Element Free Water ICP grade	1 ltr * 5

13. Manufacturer should provide Chemicals required for Testing of Pesticides along with Instruments as per below mentioned :

Sr.No	Name of Chemical	Make	Qty
1	QuEChERS for fruits and vegetable	IMPORTED	1000 nos. & 500 gcb
2	QuEChERS for pulses and food grains	IMPORTED	1000 nos.
3	QuEChERS for milk and butter etc.	IMPORTED	1000 nos.
4	Silica gel 60-100 mesh PR grade	Sigma/aldrich	500 gms *4
5	Acetic acid MS grade	Riedel/Fluka	50 ml *2
6	Ammonium formate MS grade	IMPORTED	100 gms *2
7	Ammonia Solution MS grade	IMPORTED	50 ml *2
8	Formic Acid MS grade	IMPORTED	100 gms *2
9	Florosil PR grade	Fluka	500 gms *2
10	Activated Charcoal PR grade	IMPORTED	500 gms *2
11	Celite 545- PR grade	IMPORTED	500 gms *4
12	Magnesium oxide PR grade	IMPORTED	500 gms *2
13	Glass Wool	Pyrex	
14	PSA Bonded Silica	Supelcu	100 gms *2
15	Sodium Acetate anhydrous PR grade	IMPORTED	500 gms *2
16	Aluminium oxide active natural PR grade for column chromatography	IMPORTED	500 gms *2
17	Magnesium sulphate (anhydrous) PR grade	Sigma/aldrich	500 gms *2
18	Spherical c 18 bonded flash silica 45-75 mm	IMPORTED	100 gms *2
19	N-Hexane- HPLC grade	supelcu	500 gms *6
20	Hexane- AR grade	supelcu	2.5 ltr *10
21	Hexane- HPLC grade	supelcu	500 ml * 6
22	Acetonitrile AR grade	supelcu	2.5 ltr *10
23	Acetonitrile HPLC grade	supelcu	500 ml * 6
24	Acetone AR grade	supelcu	2.5 ltr *10
25	Acetone HPLC grade	supelcu	500 ml * 6
26	Methanol HPLC grade	supelcu	2.5 ltr *20
27	Dichloromethane AR grade	supelcu	2.5 ltr *5
28	Dichloromethane HPLC grade	supelcu	250 ml *5
29	Isooctane HPLC grade	supelcu	500 ml * 10
30	Chloroform AR grade	supelcu	2.5 ltr *2
31	Isopropanol HPLC grade	supelcu	2.5 ltr *6

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