



CSIR- CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSURU-570 020, INDIA

(Constituent Laboratory of CSIR, New Delhi (Ministry of Science & Technology))
An ISO 9001:2008, ISO 14001:2004 & ISO 17025:2005, NABL Accredited Laboratory

CORRIGENDUM

Tender Ref: CFTRI/52367/25-26

Date: 05-12-2025

Tender ID: 2025_CSIR_256081_1

The revised and final specifications for the supply of Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) based on the deliberations in Pre Bid Conference held on 02-12-2025 at 11:00 A.M is uploaded herewith. All the prospective bidders are requested to take cognizance of the revised specifications and submit their bids accordingly on or before 22-12-2025 at 3:00 p.m.

All other terms and conditions of the tender enquiry document remain unaltered.

Controller of Stores & Purchase
CSIR-CFTRI, Mysore
Dt. 05-12-2025

Technical Specifications of Spectrometer-Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES)

General Tender Specification		
<ul style="list-style-type: none"> ❖ ICP-OES should be bench-top and simultaneous in all aspects of measurements, including simultaneous measurements of all analytic wavelengths, internal standard, and background using a polychromator. ❖ The ICP-OES System should be able to determine major, minor and trace elements from % to ppb in a single run measurement. ❖ Instrument should meet the global food regulation requirements (like CODEX, USFDA, EU, FSSAI, etc.). The manufacturer shall be ISO certified to meet the food regulation requirements. 		
Sl. No.	Instrument Component	Required Specification
1	Technology	<ul style="list-style-type: none"> • The system must be a high-throughput true simultaneous polychromator-based dual-view (Axial and radial)/Synchronized dual-view ICP-OES Spectrometer with rapid/fast switching.
		<ul style="list-style-type: none"> • The instrument must include an appropriate ICP torch and concentric Quartz nebulizer (Acid Resistive) spray chamber system.
2	Sample Introduction System	<ul style="list-style-type: none"> • 4 or more channels peristaltic pump speed with 70 rpm or with variable pump speed. • The flow rate should be between 0.2 - 7.0 mL/min or better, and will have the flexibility to add internal standards online.
3	Auto Sampler	<ul style="list-style-type: none"> • System should be equipped with an auto sampler with a minimum of 150 sample positions or more.
		<ul style="list-style-type: none"> • The auto sampler should have an indication of light for real-time operating status.
		<ul style="list-style-type: none"> • The auto sampler should have movement in three axes (X-Y-Z) to acceleration and deceleration speed.
		<ul style="list-style-type: none"> • System should include all accessories, racks, bottles, tubing, water container, etc.
4	RF Generator	<ul style="list-style-type: none"> • Should have software-controlled RF generator with frequency of 27 MHz or better.
		<ul style="list-style-type: none"> • The optimal power output range from 1000 to 1500 watts more in dual view variable with 10 W increment or better.

5	Gas Control	<ul style="list-style-type: none"> • Four Nos. True variable & software-controlled gas flow controllers (MFC/EFC) with ≤ 1 L/min or lower increment step for precise control of Plasma, Nebulizer, Aux & makeup/additional gas for gas. • The system must have an additional gas for the introduction of gases like Oxygen that allows for the direct introduction of organic solvents which are ≤ 100 °C boiling point. • The instrument must monitor all gas pressure through mass flow control or electronic flow control. • Plasma ignition and shut down must be software controlled and totally automated. • All gas requirements for plasma gas, nebulizer gas, auxiliary gas, purge gas, & sheer gas must be clearly mentioned. Argon gas consumption should be as low as possible.
6	Optics	<ul style="list-style-type: none"> • Must have Echelle-based polychromator design where complete UV-Visible range should be measured simultaneously. • Resolution: 7 pm @ 200/202 nm or better. • Radial viewing height automatic adjustment should be up to 15 mm or more. • The focal length of the optics should be a minimum of 200 mm or higher as per instrument design.
7	Sensitivity	<ul style="list-style-type: none"> • ≤ 10.0 ppb for the elements Mg/Ca/Be/Li • ≤ 10.0 ppb for the elements Mn/Al/Zn/Ti • ≤ 10.0 ppb for the elements Mo/Fe/Ni/Co/Cu
8	Detector	<ul style="list-style-type: none"> • The system should be simultaneous with dual view (axial and radial) system or synchronous technology with CCD detector system or charge injection device (CID) detector system and should be able to scan all wavelengths in a single run. • CID or CCD or SCD with Integration/readout time must be ≤ 1 sec. • Wavelength range: The spectrometer must cover the full spectral range from 167-780 nm or better and be capable of measuring UV and Visible wavelengths simultaneously without compromising sensitivity. • Peltier device with cooling at -30°C or below for reducing or optimizing dark current /Photometric Noise. • The system should be able to scan all wavelengths in a single shot simultaneously. The system should able to scan UV and Visible wavelengths simultaneously along with internal standard. • The entire optical system must be closed in an argon/nitrogen purged and thermo stated optical enclosure. • Viewing of the plasma must be software controlled (Dual View). • The system should have option of selecting any wavelength in any mode (axial/radial).

9	Software	<ul style="list-style-type: none"> • Latest licensed software to control all the modules of ICP-OES. • Instrument control, acquire, store, process and reproduce the data, report generation, self-diagnosis and auto-tuning. • Auto Start-up and shutdown of the instrument should be possible using a single key operation. • The system should have future upgradability for Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance if required in future. The necessary validations will have to be carried out by the equipment suppliers. • The system should have the capability to acquire the complete data of all the wavelength whatever comes from the plasma, even if the wavelength is not in the interested analyze list, so the data can be reprocessed in future for any elements and without running the sample again any element details can be acquired from old data. • Compatible with windows 11 or latest version. • Software should also have comprehensive wavelength library with indication of preferred line for each element. • It should feature automatic identification of possible spectral interferences when selecting wave lengths for analysis and should have search mode for identification of unknown wave lengths.
10	Multi vessel Microwave digestion system	<ul style="list-style-type: none"> • Applications : For acid digestion applications of samples like food & agriculture products, plastics, water & wastewater, environmental, Sediments samples, natural products, plant materials, etc. for further analysis for ICP-OES instruments. • Microwave Power: 1900 watts or more with dual magnetron. • Rotor: System should be offered with a rotor of a minimum 15 positions or more with 30 vessels for digestion. • Vessel material: PTFE- TFM; Digestion vessels should be chemical resistant, capable of handling a wider range of Acids & solvents like HNO₃, HClO₄, H₂SO₄ etc. • Vessel volume: 75 ml or more with suitable Headspace. • Minimum filling volume: 3-8 ml. • Max operating temperature: 250 °C or more. • Max operating pressure: 60 bar or more. • Maximum temperature: 300 °C or more. • Maximum vessel pressure: 80 bar or more. • Sample weight: 010 gms to 1.5 gms or higher per vessels.

		<ul style="list-style-type: none"> Vessel safety: Closure of the vessel must be possible by hand or suitable arrangement and overpressure release mechanism of the vessel must be controlled for precise opening pressure independent of the reaction temperature or sample weight. Venting with polymer/ plastic material springs or suitable mechanism. Door safety: System should have at least 5 safety switches out of which 3 safety interlocks should be for door safety & two thermal switches. IQOQ should be included with 21 CFR compliance Software.
11	Exhaust unit	<ul style="list-style-type: none"> Suitable Exhaust unit for the ICP-OES and Auto sampler to be supplied along with the System.
12	Chiller	<ul style="list-style-type: none"> The system should have a suitable re-circulating chiller.
13	Hydride Vapor Generator	<ul style="list-style-type: none"> System should be provided with Hydride/vapor generation kit and DLs to be achieved for heavy metals.
14	Desktop PC	<ul style="list-style-type: none"> Reputed branded PC with minimum configuration of Intel i7 – 14700, 32 GB DDR5 RAM, 1 TB SSD, Network card, USB Mouse, USB Keyboard, MS Windows 11 OS (64 Bit Windows 11 License) English, Windows 11 or Later (64 Bit) English. Licensed version of Microsoft Office 2023, 23" full HD LED Monitor should be provided.
15	Printer	<ul style="list-style-type: none"> HP/Dell/Brother Laser jet printer with automatic duplex printing should be provided.
16	Fume Hood	<ul style="list-style-type: none"> Dimension: Fume hood 4ft, ducting 3ft outer dimension approx 6ft L × 3ft B × 8 ft H. Body outer: Heavy-duty GI construction with 70-80 microns Epoxy coated. Body Inner: Fully moulded with fibre-reinforced plastic Resin material (FRP/PP). Working Table: High Quality Granite top. Door/Sash: Vertical rising counter-balanced wash system. Base cabinet: For chemical storage with a polypropylene cabinet for acid storage. Exhaust system: Motor blower Assembly covered with GI sheet suction expected 800-1000 cfm. Blower 1 HP motor, 1400-1450 RPM, 1-phase centrifuge blower & motor of flame-proof make Coupling: Direct Driven. Illumination: White light. Power source: 220-230 volts.
17	Standard Accessories	<ul style="list-style-type: none"> 150 Vial or more position auto sampler with enclosures & to remove toxic fumes. 1200 or more vials for auto sampler should be included. Dedicated Organic kit for alcoholic beverages analysis such as Wine, Gin, Rum, Vodka, etc., along with nebulizer, torch, injector spray chamber,

		<p>tubings, oxygen variable MFC, Organics standard mix/single element standard (Cu, Fe, Pb, Cd, As, Hg, 1000 ppm, 100 ml), organic internal standard (500 ppm, 100 ml), suitable metal free organic solvent for mixing /makeup (3L), all standards traceable to ISO 17034.</p> <ul style="list-style-type: none"> • Internal standard kit (1 No's). • HF resistant Kit along with Separate & dedicated spray chamber, nebulizer, torch and tubing set (1 set each). • Hydride generating accessories kit along with Reductant & Waste -pk/2 each should be provided for the analysis of As, Se, Sn & Hg at ppb level. • Suitable chemicals and reagents necessary for analyzing As, Hg, and other related elements using the hydride technique should be provided.
18	Essential Accessories	<ul style="list-style-type: none"> • A suitable vibration-free table with a granite top should be provided to accommodate all equipment, including the ICP-OES, auto sampler, computer, and printer. Additionally, one ergonomic revolving chair should be supplied for the analyst. • 50 Lit water capacity Two (02) Argon cylinders with double stage regulator (Matheson/ Swagelok make) & four stage Manifold should be provided. • 50 Lit water capacity Two (02) Oxygen or any other cylinders with double stage regulator (Matheson/ Swagelok make) should be provided. • Gas purification panel for all gases should be provided. • Reputed brand noiseless & oil free Air compressor (if required). • Single element aqueous standards traceable to ISO 17034 (Na, K, Ca, Mg, Fe, Zn, P) – (10,000 ppm, 100 ml). • Suprapure Trace metal grade (ICP MS grade) HF – 500 ml. • Suprapure Trace metal grade (ICP MS grade) H₂SO₄ – 500 ml. • Suprapure Trace metal grade (ICP MS grade) H₂O₂– 500 ml. • Wavelength calibration solution 500ml, 5ppm (13-14 element mix): Qty - 2 Nos (if required). • Internal mix standard aqueous (500 ppm, traceable to ISO 17034): - 100ml • Two Nos PP waste container (15 L each) Standard Peristaltic Pump Tubing set for sample intake Pk/12 (4 Set each). • Standard Peristaltic Pump Tubing set for rinse /Drainage: Pk/12 (2 Set each). • Standard Peristaltic Pump Tubing set for internal standard. Pk/12 (2 Set each). • Organic solvent Tubing set for sample intake Pk/12 (3 Set each). • Organic solvent Peristaltic Pump Tubing set for rinse /Drainage: Pk/12 (2 Set each). • Standard spray chamber (4 Nos). • Standard Nebulizer (4 Nos). • Nebulizer cleaning tool (1 No).

		<ul style="list-style-type: none"> • Standard Torch & injector: (4 Set). • Standard Spray chamber drain tubing (4 each). • Auto sampler tubing set Pk/12 (2 set). • Nebulizer capillary tubing -1 Meter (2 Set). • PFA tubing for gas supplies to nebulizer- 1 Meter- (3 Set). • Hydride kit peristatic pump tubing for reductant & Waste -pk/12 (2 sets each). • RF Coil (2 No's). • If consumables /Spares required to handle the tail plume of the plasma that should be quoted for 5 years of operation. • Self-standing centrifuge tubes 50 ml (500 No's). • Centrifuge tubes 15 ml (500 No's). <p>Operational manuals should be provided.</p>
19	Operation and maintenance & Training Component	<ul style="list-style-type: none"> • The supplier will have to carry out successful installation at our laboratory premises and to provide onsite comprehensive training to technical staff for minimum 10 working days for operating the system or until customer satisfaction.
20	IQ/OQ/PQ	<ul style="list-style-type: none"> • On site IQ, OQ, PQ of instrument along with document to be provided as per NABL 17025: 2017 requirement. • After successful installation, the supplier shall define and perform the accuracy (at LOQ level) and precision (at LOQ, 2 x LOQ, 4 x LOQ) of the specified metals for different matrices such as Sodium Chloride & Pickles (for Na), Raw Banana & banana products (for K), Ragi powder (for Ca), Cereal products (for Mg), Fortified Rice Kernel (FRK) & Vitamin Mineral Premix samples (for Fe), raw Fish samples (for Zn), Nuts (for Mn), Chocos (for Cu), Rum/Gin/Votka (for As & Hg) etc., within our laboratory and submit a report in accordance with NABL ISO/IEC 17025:2017 requirements.
21	Warranty & others	<ul style="list-style-type: none"> • Standard Warranty of minimum 24 months (for ICPOES, Microwave digestion System, Exhaust system and Fume hood) starting from date of satisfactory, installation and acceptance of the equipment. • Annual Maintenance Contract Service for 60 months after expiry of warranty period (24 months) should be quoted separately on yearly basis. • The vendor should guarantee the availability of spares for a minimum of 10 years from the instrument's commissioning date. • A current user's / performance list with contact details (Customer name, phone email ID, etc.) and installation date for government institutions to be provided.

		<ul style="list-style-type: none"> • The breakdown or any other foreseen performance issues of the instrument during the warranty has to be addressed within downtime of one week. • A point wise compliance statement as per the specifications must be submitted along with the offer. All specifications must be clearly highlighted in the brochure for verification and all eligibility conditions should be verifiable. • The quoted model product catalogues attached along with the tender bid, should be available in the Global Public Platform (example in their official website or any other authentic source) and if CSIR-CFTRI requires to verify with the OEM, the complete contact details of the official, who is authorized by the OEM, to be provided, along with their Mobile/Telephone Number. E-Mail ID, Postal Address, etc., in the Technical Bid. • The bidder should have installed minimum three ICP-OES instruments in a five years in any Government Research Organizations such as CSIR, ICMR, ICAR, IISc, IITs, etc. in India. • The supplier must submit OEM technical brochures and proper application notes/manuals adequately explaining and confirming the availability of the features in the model of the equipment being quoted.
22	Pre installation requirements	<ul style="list-style-type: none"> • All pre-installation requirements necessary for the installation and commissioning of the instrument to be provided. Site visit is recommended.