

# CSIR – NORTH-EAST INSTITUTE OF SCIENCE AND TECHNOLOGY (CSIR-NEIST)

## Jorhat-785006, Assam (India)

CSIR – North-East Institute of Science and Technology (CSIR-NEIST), Jorhat, Assam is planning to procure **Automatic Bench Top Inductively Coupled Plasma-Mass Spectrometer with Triple Quadrupole Mass Spectrometer (ICP-MS) for Trace Element/Isotopic Analysis of Soil, Rock, Coal, Clay, Catalytic, Water, Geological Materials, Bio-materials, etc. samples**. In this regard, CSIR-NEIST, Jorhat is going to hold a Pre-Indent Conference (PIC) from the manufacturers / their authorised channel partners or agents / suppliers and system integrators for supply, installation, commissioning and demonstration of the said equipment.

**Interested parties are requested to submit their response along with other necessary documents to the Stores & Purchase Officer, CSIR-NEIST, Jorhat, Assam on or before 04.10.2018**

A Pre Indent Conference (PIC) will be held in **05.10.2018** from **10.00 AM** onwards.

After the above conference / meeting, specifications shall be finalized after knowing / obtaining details about relevant/available technology in the market suiting the requirement and needs of CSIR-NEIST and accordingly tenders will be called. The decision taken by CSIR - NEIST will be final and binding on all the parties.

Mere participation in the Pre Indent Conference do not imply that the firms / companies have the right to submit their bid.

### **GENERAL IMPORTANT NOTE:**

The instructions mentioned below should be read carefully by the bidders before submitting the response and the relevant documents.

- a. No request for change in dates will be entertained. CSIR-NEIST reserves the right to change any or all of the components and dates. The decision taken by CSIR-NEIST would be final and binding on all the prospective bidders
- b. Bids will be invited after the PIC along with standard terms & conditions along with Earnest Money Deposit, Performance Bank Guarantee, Agreements etc.
- c. The bidder shall bear all costs associated with the preparation and submission of EOI, attending pre-indent conference etc., and CSIR-NEIST will in no case be responsible or liable for these costs.
- d. Bidders Information Form (as per format given in **Annexure B**), and Performance Statement Form (as per format given in **Annexure C**) should be provided along with EOI.
- e. CSIR-NEIST may ask for clarifications or further information to evaluate the Expression of Interests. If any information sought in this document is missing or not clearly specified by the bidder, it will be assumed that the bidder is not in a position to supply the information.
- f. Canvassing in any form would disqualify the bidder from further participation.

- g. The firms may give their comments/views in writing also within the stipulated time. Further this PIC will be only for having the idea of recent developed technology to include those specifications in our requirement if it facilitates and improves our R&D.
- h. In any case, the specifications/parameters suggested by the firms will not be binding on us.
- i. Moreover, after PIC, there will be open tender for all bidders whether they have participated in PIC or not.

### **PRE INDENT CONFERENCE (PIC)**

#### **1. A DRAFT specification / requirement is given at “Annexure A” as a base for discussion.**

A Pre Indent Conference will be held at CSIR-NEIST, Jorhat Campus after finalizing the detail specification with prospective bidders will be held in **05.10.2018** from **10.00 AM** onwards.

- 2.** A maximum of three authorized representatives per bid may attend the Pre Indent Conference. Vendors should communicate the names of the representatives to the Stores and Purchase officer along with the EOI submission.
- 3.** The prospective bidders are requested to bring documents to prove their technical capabilities, clientele list, financial capabilities, experience and credentials etc. The firms will give their presentation followed by discussion to finalize the specification.
- 4.** Director, CSIR-NEIST, Jorhat, Assam reserves the right to accept or reject any application/suggestions without assigning any reasons whatsoever.

#### **Stores & Purchase Officer (SPO)**

**CSIR – North-East Institute of Science and Technology (CSIR – NEIST)  
Pulibor, Jorhat-785006 Assam, India.**

Telephone: 0376-2372710

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**Requirement of Automatic Bench Top Inductively Coupled Plasma-Mass Spectrometer with Triple Quadrupole Mass Spectrometer (ICP-MS)**

***(This is only a draft specification of our needs or requirements. We are looking for the information of all kind of Automatic Bench Top Inductively Coupled Plasma-Mass Spectrometer with Triple Quadrupole Mass Spectrometer (ICP-MS)***

***Hence, all the manufacturers / distributors / dealers dealing with Automatic Bench Top Inductively Coupled Plasma-Mass Spectrometer with Triple Quadrupole Mass Spectrometer (ICP-MS) are invited).***

**Quadrupole Inductively Coupled Plasma Mass Spectrometer  
ICP-MS)**

**Key Specifications:**

Automated, quadrupole inductively coupled plasma mass spectrometer (ICP-MS) system based on a quadrupole mass filter. Should be capable of measuring major, minor, trace and ultra trace levels (*ppt to per cent*) multi elemental/isotopic analysis of Soil, Rock, Coal, Clay, Catalytic, Water, Geological Materials, Bio-materials, etc., with high accuracy and precision for routine and R & D applications. The instrument credibility should have been established at least last ten years in the form of research publications in internationally reputed earth science/chemical journals. Accuracy and precision have to be demonstrated. The supplier should provide a complete list of users worldwide with full address, e-mail and telephone numbers. The system should comprise of the following components:

**1. Sample Introduction System**

- Standard single piece quartz with wide diameter; min 2.5 mm for matrix decomposition and sample ionization.
- Spray Chamber: Temperature controlled Spray-chamber with capability for faster temperature equilibration and extended temperature range (-25o C to 80oC with an accuracy of  $\pm 0.1$  oC) by effectively improving signal stability and reducing oxide interferences.
- Nebulizers: Micro Mist Glass concentric nebulizer. Availability of other Nebulizer types like Micro flow/PFA nebulizer for HF medium, etc should be available as option.
- System should have provision for direct handling of samples with high TDS eliminating the process of sample dilution in liquid phase. It should have computer controlled peristaltic pumps with minimum of three channels.
- Apart from glass nebulizer spray chamber, HF resistant spray chamber as well as PFA nebulizer spray chamber system should be provided.

**2. Ion Source**

- Argon plasma torch
- RF generator of power of minimum output 1.5 kW or more and minimum frequency of 27 MHz.

## **Extraction Interface:**

- Pt-tipped sampler cone with 1.0 mm diameter orifice and Pt-tipped skimmer cones with 0.45 mm diameter orifice with three additional sets of Pt-tipped sampler and skimmer cones.
- Sample and skimmer cones should be easily mountable and dismountable.
- Option for platinum cones.
- The system should not require changing any hardware in the interface/cones to determine trace level concentration of elements in high matrix samples at the same time.

## **Ion optics**

- Ion optics should have excellent focusing with off-axis system to analyzer and detector to eliminate photons and neutrals.
- Background noise must be less than  $<1$  cps at 4.5 amu.

## **3. Cooling System**

- Adequate water re-circulating chiller should be provided for continuous cooling of RF generator, RF load coil and ICP interface

## **4. Vacuum System**

Should have rotary pump and turbo molecular pump with split flow for extremely high gas throughput. Vacuum should be better than  $5 \times 10^{-6}$  mbar in open valve condition and shall be better than  $1 \times 10^{-6}$  mbar in closed valve condition.

## **5. Mass Analyzer System**

- It should be a true hyperbolic profile quadrupole and should operate at 2.0 MHz or more to provide superior ion transmission, resolution and abundance sensitivity.
- The analyzer quadrupole should discretely control the resolution of the selected mass region
- Dynamically without affecting the overall nominal resolution of the system.
- Mass Range. The entire mass range in-between 4 to 260 amu or more.  
Scan Speed:  $\geq 90000$  amu/sec
- **Mass Resolution:** Variable from 0.3 amu to 1.0 amu
- **Mass Stability:** 0.025 amu/Day or better

## **6. Gas Flow Control System**

- The gas flow control system should be of microprocessor-based precision electronic mass flow controller for all the gas channels (minimum five nos.) such as plasma support, auxiliary and sample carrier gases with provision for additional controllers for Laser Ablation, and Oxygen supply (accessory for organic samples)
- The gas flow control system should have computer-controlled safety interlocks and automatic gas flow controls for startup and shutdown operation.

## **7. Detector System**

- The ion detector should be a discrete Dynode electron multiplier unit or equivalent. Detector should be able to analyze high and low concentration of isotopes simultaneously with 9 orders or more dynamic range in a single scan.
- Both the analog and pulse counting modes should be protected against overload. Minimum dwell time 100 $\mu$ s in both pulse count and analog mode

## Interference Removal System

In addition to Standard Mode, the system must be having a Cell before the mass analyzer which is capable of removing polyatomic interferences on various analytes by using Reaction/Collision Mechanisms in a single run.

### 8. Auto Sampler

- Auto sampler for handling about 100 sample vials of about 10 ml capacity each.

### 9. Instrument Control and Data Acquisition & Processing

- Suitable interface should be provided for operation and data acquisition
- The vendor should provide a branded PC of latest configuration with ~32" LED monitor with color laser jet printer.

#### Performance:

- Sensitivity Performance:
- For  ${}^7\text{Li}$  (7): 55Mcps/ppm,  ${}^{89}\text{Y}$ : 320 Mcps/ppm,  ${}^{205}\text{Tl}$ : 250Mcps/ppm
- Oxide ratio: CeO/Ce: < 1.0 %.
- Background: (9 amu): <1cps
- Isotope ratio precision — (%SD)  ${}^{107}\text{Ag}/{}^{109}\text{Ag}$  <0.1
- Environmental Factors:
- Temperature: 15 to 35°C, Relative Humidity: 20 to 85%.

### 10. System control and data acquisition

The system should perform auto optimization of plasma parameters like plasma power, plasma gas flow, etc. The instrument software shall allow auto - tuning to enable the instrument to be used with the consistent and reproducible day-to-day performance independent of the operator.

### 11. Acquisition mode: Peak jumping, scanning, Time resolved analysis, Isotope Ratio measurements using integral software.

### 12. Analysis mode: Shall allow for semi quantitative analysis, external calibration and internal standard addition methods for fully quantitative analysis, allowing parts per trillion level analysis and isotope ratio measurements with precision better than 0.2 % RSD.

### 13. Report Generation: Output results formatted in mixed concentration units e.g. ppt, ppb, ppm, etc.

### 14. Quality control and software: Software for automated QA/QC during unattended operation. Off-line data processing and exportability of data to other standard packages should be available. Matrix specific databases to provide preferred isotope selection should be available. Master copies of all relevant software must be supplied. All instruction manuals and service manuals must be supplied along with the instrument. Six each geological and environmental reference materials (GEOREM) including other six multi-element NIST traceable standards must also to be supplied.

### 15. Argon cylinders (4) and Reaction/Collision gas cylinders (3); Double stage argon regulators (3).

### 16. Gas Manifold for gases with purifiers, valve & tubing / fitting

### 17. Polypropylene made Fume Hood with Exhaust System;

**Upgrade path:**

- System should be compatible to be upgraded in future with Laser Ablation system, LC-ICP-MS and GC-ICP-MS operation for speciation studies, etc.
- Power Supply
- Equipment should be operated at 220/440 V  $\pm$  10 %, single/three phase and 50 Hz power supply. Also, 10KVA Online UPS System, 60 min back-up with Isolation, SMF Batteries, Battery Rack and Battery Interconnecting Cables must be supplied along the system.
- Installation Utilities: Exhaust system, Gas cylinders and regulators, etc. to be supplied by the vendor.

**10. Warranty**

- Two years warranty from the date of installation with free replacement of any part, if required. AMC should be quoted for three years service support after warranty.

**11. Spare Parts and consumables**

- Spare components for trouble-free operation required for next ten years after completion of warranty period should be clearly listed and quoted separately as option.
- Spares/consumables that will be supplied free of cost with the system should also be listed.

**12. Installation and Acceptance Testing**

- Installation and acceptance testing requirements should be explicitly mentioned along with the technical bid/ specification.

**13. Training**

- Onsite training for about 6 scientists should be given during installation for ten working days.
- Training for one application scientist and one maintenance scientist for at least ten working days at the application laboratory of the firm.

**14. Software Upgrades**

The firm should provide software upgrades from time-to-time at least for the coming five years after the installation.

**15. Laser Ablation system (to be quoted as optional)**

Laser should be having a working wavelength of 213 (Nd) with a Repetition Rate of 1-15 or more.

**Aperture:** Variable Apertures should be available to add the flexibility in operations. It should have an aperture system with in excess of 100 possible crater sizes.

**Fluence:** > 25 J/cm<sup>2</sup> at the sample surface

**Spot Sizes:** > 10 between 4  $\mu$ m & 250  $\mu$ m.

**Beam Profile:** Beam Profile should be internally Homogenized & having a Resolution of < 1.5 Micro (XY stage).

**Mass Flow Control** should be Fully Software controlled & Triggering should be Bidirectional for full control Polarizer.

**Polarizer:** Software Controlled polarizer should be a part of the main system.

**Aperture:** 2 aperture imaged beam-delivery systems should be offered in the system

**Video (view):** Dual View Video should be a part of the main system. Dual View should comprise of two digital camera systems, one enabling a high magnification image of the sample (32" Monitor), and the other a large field of view for easy sample navigation.

**Ablation Chamber:** A high performance, two volume ablation chambers should be supplied as standard.

**BIDDER'S INFORMATION FORM**

*[The interested bidders shall fill in this form and should submit at the time of attending PIC. This should be done on the letter head of the firm]*

1. Bidder's Legal Name :
  
2. Bidder's actual or intended Country of Registration :
  
3. Bidder's Legal Address in Country of Registration :
  
  
4. Bidder 's Authorization Representative Information  
Name :  
  
Address :  
  
Telephone/Fax numbers:  
  
Email Address :
  
5. If Bidder is not the manufacturer of the item, then details of manufacturing

**PERFORMANCE STATEMENT FORM  
(For a period of last 3 years, some or all)**

Name of the Firm.....

Order Placed by (full address of Purchaser)	Order No. and date	Description and quantity of ordered equipment	Value of order	Date of completion of delivery as per contract	Date of actual completion of delivery.	Remarks indicating reasons for late delivery , if any	Has the Equipment been installed satisfactory (Attach a certificate from the purchaser/ Consignee)	Contact person along with Telephone No., FAX No. and email address

Signature and Seal of the manufacturer/Bidder.....

Place:

Date: