Recommendation of TSC on

Pre-bid meeting for procurement, Installation & Commissioning of "Multichannel Potentiostat and Galvanostat workstation with EQCM Module and SERS laser accessories"

Venue: Saranjamshala, CSIR-AMPRI, Bhopal

Date: 27-02-2025 Time: 11.00 AM onward

A Prebid meeting was scheduled for 27-02-2025, from 11:00 AM onwards. The following parties participated in the Prebid meeting.

(i) Mr. Vinay Tiwari and Mr. Uday Patekar are representatives from Metrohm, India.

(ii) Mr. Avinash Chandak, GM, Technos Instruments, emailed dated Feb 27, 2025, 6:22 AM, with non-technical queries regarding payment and delivery terms, and they do not have any queries on the requested technical specifications.

After detailed technical discussion, the following minor changes in the technical specification of the tender documents are made.

Sr. No.	Tendered specification	Revised tendered specification	Reason for revision
1	**Multichannel Potentiostat/Galvanostat**		
	(iv) Maximum current: ± 0.5 A or higher	Maximum current ± 0.4 A or higher	More generalized
	(vi) Maximum number of channels: Minimum 2 channel or better	Minimum 2 working channels or more	For further upgradation
	(vii) Potential accuracy: ± 0.1% or better	± 0.2% or better	More generalized
	(viii) Measured Current accuracy ± 0.05%	± 0.2% of current range or better	More generalized
2	**SERS instrument**	**SERS instrument (in-situ)**	**For inclusive performance**
	Excitation Laser:		
	i. 532nm 100mW Diode Laser ii. 785nm 300mW Diode Laser	i. 532nm with at least 40mW Diode Laser ii. 785nm with at least 300mW Diode Laser	As per discussion in the committee, changes in the specification do not affect the end use requirement of the product.
	iii. Software controlled power variation at an interval of 1%	Software controlled power variation	As per discussion in the committee, changes in the specification do not affect the end use requirement of the product.

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Fiber Optic Probe	**Fiber Optic Probe: (in-situ integrated with electrochemical)**	**Better performance**
i. Dedicated fiber optic probe for 532nm and 785nm lasers	Dedicated fiber optic probe for 532 nm and 785 nm lasers	As per discussion in the committee, changes in the specification do not affect the end use requirement of the product.
iii. 200 µm Raman Signal delivery fiber	200 µm Raman Signal delivery fiber or better	More generalized
iv. Standalone Probe Focus: 7.5mm	Standalone Probe Focus: 5mm or higher	Can handle less Sample distance
Grating:		
i. 1200 lines/mm grating blazed at 750nm should be provided, which will be added to the existing spectrometer	i. 1200 lines/mm grating or better	More generalized
Upright Optical Microscope:	**Upright or top-bottom Optical Microscope:**	**More generalized**
i. x10, x20, x50 LWD Objective lens	x10, x20, x50 Objective lens	Similar specifications
ii. Halogen Illumination	Halogen Illumination or LED	Any one source is required
iii. Transmitted and Reflected Illumination modes	Transmitted or Reflected Illumination modes	Anyone is required
Heating/Cooling Stage:	**Integrated Stage for Heating/Cooling:**	
-190 to 600 degrees Centigrade to be integrated to above system for Low temperature and High Temperature Raman/PL application.	-190 to 600 degrees Celsius for Low temperature and High Temperature Raman/PL application.	As per discussion in the committee, changes in the specification do not affect the end use requirement of the product.
Upgradation:		
i. Option to have Raman Imaging feature	i. Option to have Raman Imaging feature, and Option for upgradation of current ranges and number of channels	Electrochemical upgradation is also needed in future

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	ii. Offered System must be attachable from Hardware and Software point with Confocal Micro Raman setup at CSIR-AMPRI	ii. Offered System must be attachable from Hardware and Software point with Confocal Micro Raman setup	Minor changes to make it more generalized
	iii. Resolution: 0.75 cm-1/pixel with 785nm excitation with 1200 lines grating, 0.75 cm-1/pixel with 532nm excitation with 1800 lines grating	iii. Resolution: 0.75 cm-1/pixel with 785nm excitation with 1200 lines grating, 0.75 cm-1/pixel with 532nm excitation with 1800 lines grating	Change is not acceptable because this is an important parameter for R&D work
	iv. Gratings are mounted on a high precision motorized turret controlled by software Spectral Range of Raman measurements: 200 to 3200 cm-1	iv. Grating is mounted on a high precision motorized turret controlled by software Spectral Range of Raman measurements: 200 to 3200 cm-1	Change is not acceptable because this is an important parameter for R&D work
	Detector		
	i. BI CCD with low noise	i. BI CCD/CCD with low noise	Similar specifications
	ii. SNR is 100,000: 1	ii. SNR is 60,000 to 100,000: 1	Lower to higher full range
	iii. TE Cooling: -60 C	iii. TE Cooling: -60 °C or better	Change is not acceptable because this is an important parameter for R&D work
	iv. Pixel Size: 2000 x 256, 15 x 15 um	iv. Pixel Size: 15 x 15 um or better with 512 x 256 resolution or better	Lower to higher complete range
	v. Range: 200-1100 nm	v. Range: 200-1100 nm	No Change
3	**Electrochemical Quartz Crystal Microbalance module**		
	ii) Operational Frequency range: 4 MHz – 160 MHz or higher iii) Frequency accuracy: ± 0.5Hz or better	ii) Operational Frequency range: 4 MHz – 160 MHz or better iii) Frequency accuracy: ± 1 Hz or better	As per discussion in the committee, changes in the specification do not affect the end use requirement of the product.

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4	**EIS module (2 units)**		
	iii. AC amplitude range: 1 mV to 900 mV rms	AC amplitude range: 1 mV to 900 mV rms or compatible	As per discussion in the committee, changes in the specification do not affect the end use requirement of the product.

We shall abide by the Code of Integrity and Conflict of Interest for Public Procurement as per para 3.2.1 of CSIR Manual 2019.

Dr. Raju Khan
Indenter

Dr. Prabhat K Baghel, Member

Dr. Sandeep Singhai, Member

Dr Archana Singh
Domain Expert

Dr. (Er) Manish Mudgal
Chairman

After Prebid Meeting Revised Specifications

Multichannel Potentiostat & Galvanostat Workstation with EQCM Module and SERS Laser Accessories

1. **Multichannel Potentiostat/Galvanostat**

i.	Potential range	-6 V to 6 V or higher
ii.	Electrode Configuration	2,3 or higher
iii.	Compliance voltage range	± 8 V or better
iv.	Maximum current	± 0.4 A or higher
v.	Current ranges	100 nA to 400 mA or better
vi.	Maximum number of channels	Minimum 2 channels or higher
vii.	Potential accuracy	± 0.2 or better
viii.	Measured Current accuracy	± 0.2% of current range or better
ix.	Potential resolution	3 µV (gain 100) or better

2. **SERS instrument (in-situ)**

Excitation Laser:

i. 532nm with at least 40mW Diode Laser
ii. 785nm with at least 300mW Diode Laser
iii. Software controlled power variation

Fiber Optic Probe: (in-situ integrated with electrochemical)

i. Dedicated fiber optic probe for 532nm and 785nm lasers
ii. 100 µm Laser delivery fiber
iii. 200 µm Raman Signal delivery fiber or better
iv. Standalone Probe Focus: 5mm or higher
v. Optical density of Filters: 6 or more

Grating:

i. 1200 lines/mm grating or better

Upright or TOP/Bottom Optical Microscope:

i. x10, x20, x50 Objective lens
ii. Halogen Illumination or LED
iii. Transmitted or Reflected Illumination modes
iv. Fiber optic probe must be integrated with the microscope

Integrated Stage for Heating/Cooling:

i. -190 to 600 degrees Celsius for Low temperature and High Temperature Raman/PL application.

Upgradation:

i. Option to have Raman Imaging feature, and Option for upgradation of current ranges and number of channels
ii. Offered System must be attachable from Hardware and Software point with Confocal Micro Raman setup with the below specification:

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iii. Resolution:

0.75m^{-1}/pixel with 785 nm excitation with 1200 lines grating,
0.75m^{-1}/pixel with 532 nm excitation with 1800 lines grating

iv. Grating is mounted on a high precision motorized turret controlled by software:

Spectral Range of Raman measurements: 200 to 3200 cm^{-1}

v. EC-SERS cells (2 or more), compatible connector integrated with electrochemical analyser

vi. Quartz cuvette, with PTFE lid and cuvette holder

vii. Platinum mesh electrode as the working electrode, a platinum wire electrode as the Counter electrode, a silver/silver chloride in KCl 3M electrode as the reference electrode.

Detector

i. BI CCD/CCD with low noise
ii. SNR is 60,000 to 100,000: 1
iii. TE Cooling: -60 °C or better
iv. Pixel Size: 15 x 15 um or better with 512 x 256 resolution or better
v. Range: 200-1100 nm

3. Electrochemical Quartz Crystal Microbalance module

i) Number of Cell Units: 1
ii) Operational Frequency range: 4 MHz – 160 MHz or better
iii) Frequency accuracy: ± 1Hz or better
iv) Frequency resolution: 0.1 Hz or better
v) A complete EQCM kit with EQCM Module, EQCM working electrode, EQCM counter electrode, EQCM reference electrode

4. EIS module (2 units)

i) Hardware/software (EIS): Potentiostatic/Galvanostatic control
ii) Frequency range: 10 µHz - 1 MHz or better
iii) AC amplitude range: 1 mV to 900 mV rms or compatible
iv) Data presentation: Nyquist and Bode Plot, Mott-Schottky, Data analysis, electrical circuit analysis and data fitting
v) It should be supplied with powerful fit and simulation software for the analysis of impedance data.

5. Electrodes Accessories

i) 100 SERS substrate and 500 carbon SPE, 100 multi-WE carbon SPE with suitable connectors should be provided.
ii) Glassy carbon electrodes (3 unit), Platinum wire electrodes (10 cm, 3 unit), Ag/AgCl reference electrode (3 unit) with suitable polishing and cleaning kit.

6. Electrochemical cell vials of various volumes (ranging in 5-20 mL volume) with suitable stand and stable connections.
7. Warranty of 2 years (AMC of 2 years to be mentioned).
8. **High-performance workstation with specifications & warranty of 2 years:**
   i. **Processor (CPU), 2 units**
      a. Type: High-performance multi-core processor (Intel)

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b. Intel Core i7/i9 or better with clock speed: 3.0 GHz or higher,
c. Graphics Processing Unit (GPU): NVIDIA RTX 4080 or higher with memory of 8GB VRAM or higher for graphical applications and simulations
d. Memory (RAM): with capacity of 64GB or more and speed DDR5

ii. **Storage, 2 units**
   a. Primary storage (for OS and active applications): NVMe SSD with 1TB or more of storage
   b. Secondary storage (for data storage, backup, and long-term projects): 1TB or more SATA SSD
   c. Motherboard compatible with above hardware and software support having thunderbolt port or USB 3.1, multiple USB 3.0, USB-C ports, and networking wired gigabit ethernet (at least 1GbE, 10GbE preferred for large data transfers), wireless: Wi-Fi 6 (802.11ax) for wireless connectivity,
   d. Power Supply Unit (PSU) with wattage of 750W to 1000W, efficiency of 80 Plus Platinum or Gold efficiency rating, and in-build cooling system

iii. Data Acquisition and Control Interface
   a. Interface: Ensure the workstation has support for specialized electrochemical equipment

iv. Operating System
   a. Windows 11 Pro or higher
   b. Genuine MS office software and statistical analysis drivers.

v. Software Requirements
   a. Origin Lab/Sigmaplot for data visualization and analysis

vi. **Peripheral Support, 2 units**
   a. Monitors: Dual monitors 32 inch or higher (preferably 4K or ultrawide for multitasking and data visualization)
   b. Keyboard and Mouse: wireless, ergonomic, responsive

9. **A printer** automatic duplex laser printer, scanner, copier, connectivity of USB, Ethernet, Wi-Fi, Cloud and a standard warranty.
10. Suitable **UPS (minimum 2 KV or higher)** for stable operation of the instrument.

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फ़ाइल क्र.: PUR/EQP/142(2024-25)

विषय :Supply, Installation & Commissioning of Multichannel Potentiostat and Galvanostat workstation with EQCM Module and SERS laser accessories.

S/no	Queries	Tender's reference	Response
01.	Payment terms: 100% payment via inland LC option with 90% on shipment delivery and 10% on installation and training.	Special conditions of contract (SCC) GCC 2.22.1	If required (depending on the merits of the case), 100 % payment through inland LC after Successfully supply installation and commissioning of equipment and after submission of 05% PBG.
02.	Delivery Date: At least 03 months from the date of PO.	Chapter 3 Schedule of Requirement	Delivery date is to be mentioned by the supplier under the schedule of requirement of Chapter 3

Sd/-
भंडार एवं क्रय अधिकारी
Stores and Purchase Officer
CSIR-AMPRI, Bhopal.