

**INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
JADAVPUR, KOLKATA -700032**

TENDER NOTICE NO. IACS-P/ICTP/2024-25/22

Dt:04.07.2024

Sealed tenders in two bid systems (Technical Bid and Price Bid) are invited from bonafide, resourceful, and eligible manufacturers/exclusive distributors/vendors for one **“Electrochemical workstation with bipotentiostat, RRDE and spectroelectrochemistry set up”** with the following specifications. Part I (Technical Bid) of the tender should contain technical details and commercial terms and conditions, and Part II (Price Bid) should indicate group-wise price as mentioned in the Technical Bid. The Technical Bid and Price Bid are to be submitted in two separately sealed envelopes distinctly marked accordingly, and both are to be put inside another envelope, which should be sealed and superscribed with tender reference number and due date. The bidders may submit bids duly signed on their own letterheads.

Completed tender bids should reach the office of **School of Chemical Sciences, Indian Association for the Cultivation of Science (IACS), 2A & 2B Raja S. C. Mullick Road, Jadavpur, Kolkata-700032** on or before the scheduled date and time specified below:

Tender Notice No	IACS-P/ICTP/2024-25/22 dt.04.07.2024
Last date and time of submitting tender	July 25, 2024, up to 5.00 PM
Pre-bid meeting to discuss technical specification	July 16, 2024, at 11.00 AM
Date and time of opening tender	July 26, 2024, at 3:00 PM
Place of pre-bid meeting and opening tender	In the office of Prof. Tapan Kanti Paine, IACS
Contact	E-mail: ictkp@iacs.res.in Tel.+91 33 2473 4971 (Ext. 1357)

Technical bids will be opened first to evaluate technical specifications of the equipment and thereafter the price bids of only the technically qualified distributor/vendors will be opened.

Technical Bid Evaluation: The Technical Bids will be evaluated in the presence of the representatives of intending bidders who will be able to clarify technical aspects of their bids, if any, required by the Technical Evaluation Team.

Opening of price-bid: The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their e-mail addresses. The rest of the bids will be rejected.

Please note that IACS will not provide any accommodation or expenses to any of the bidders for attending the technical bid/price bid opening.

1. TECHNICAL BID:

The Technical Bid should contain technical details and commercial terms and conditions and be kept in a separate envelope duly superscribed as “**Technical Bid**” on the outer cover.

Detailed Technical Specifications of “Electrochemical workstation with bipotentiostat, RRDE and spectroelectrochemistry set up”

A multichannel potentiostat / galvanostat is required along with EIS & BIPOT. The specifications should be as follows:

Technical Specifications of Channel 1:

- Compliance voltage: Standard ± 16 V or better at ± 350 mA or more current
Note: Adjustable compliance voltage configurations should be mentioned separately
- Maximum Output Current: ± 350 mA or better at ± 16 V.
- Current boosting option: Expandable to ± 8 A measured current or better with Current Booster at unchanging compliance voltage of ± 16 V and 0.0004% measured current resolution
- Output Voltage Range: ± 10 V or better
- Maximum scan rate: 800V/s with 25 mV steps
- Current Ranges: ± 10 nA to current range 100 mA in multiple ranges
- Measured current accuracy: 0.0004% of current range (40 fA at 10 nA range): Must be a default hardware configuration without any additional external accessories or current boosters.
- Built-in Current Integrator: to separate faradaic current from capacitive current and also directly measure integrated charge in real-time rather than current.
- Built-in Electromagnetic Noise filter: The system hardware must have internal third order Sallen-key filters for removing background noise that cannot be removed by simple measures such as faraday cage
- Measured Potential Resolution: 5 μ V or better
- Potentiostat Rise/fall Time: < 350 ns or lower
- Interface: USB interface for connection with PC.
- Input bias current: < 2 pA or lower
- Bandwidth of electrometer: > 3 MHz or higher
- Input impedance of electrometer: > 90 GOhm // 5 pF or higher

Hardware for Bipotentiostatic Measurements:

An internal dual-mode bi-potentiostat option is required. Parallel measurements should be possible on two working electrodes sharing the same counter and reference electrode. The bi-potentiostat feature should be functional in at least two modes. In the first mode, a fixed potential is required to be applied to the second Working Electrode while applying a potential step or a sweep to the first Working Electrode. In the second mode, a potential

offset with respect to the first working electrode is required to be applied to the second working electrode.

Potential Offset Range: ± 10 V or better, Maximum Current ± 35 mA or better.

The RRDE software should have fully automated analysis and plotting option for Levich and Koutecky-Levich analysis.

Hardware for RDE/RRDE Controller:

Rotation rate range 100-10000 rpm with a resolution of 1 rpm. The rotor should have the capability of remote as well as manual control. Mercury less contact and should be from same manufacturer.

Software

The Software to be provided with the Potentiostat / Galvanostat should be comprehensive, fully windows based with three-dimensional view of graphics and analysis software. Software should record current, voltage and time for cyclic and linear sweep voltammetric measurement. It should be possible to record current, voltage and time data in tabular format for each measuring point in voltammogram. Software should be capable of supporting a wide variety of electrochemical techniques as mentioned below.

- Cyclic & Linear Sweep Voltammetry
- Linear Polarization
- Differential Pulse, Sampled DC & Square Wave Voltammetry
- Chrono-amperometry, chrono-coulometry and chrono-potentiometry ($\Delta t > 1$ ms)
- Tutorials to help the user to familiarize with software
- Programming of different electrochemical methods and optional accessories
- Software Development Kit to control the PGStat using Labview Software.
- Comprehensive database structure & powerful data analysis tool.
- Inbuilt electrochemical spread sheet
- User programmable formulae to new plots.
- Powerful graphic engine with useful features such as individual Axis scaling, overlays, multiple Y axes, plot addition, zooming and rotation.
- Each plot should be saved as a vector image file to use directly in paper or presentation.
- Channels should work independently.
- Possible to perform impedance and bipotentiostatic measurement simultaneously

The system must have capability for hybrid measurements such as E-SPR, SECM, Spectro-electrochemistry, IMPS-IMVS etc. It should have TTL triggering, ADC, DAC based communication ports.

Electrode & accessories:

- Complete set up of Cell stand with 20ml glass vial Teflon base, stand rod, teflon lid, purge tube each qty. 1
- Glassy Carbon working electrode qty. 4
- Glassy carbon for CPE measurements 2
- Pt working electrode qty. 2

- Ag/AgCl reference electrode (aqueous) qty.2
- Ag/AgCl reference electrode (non-aqueous) qty. 1
- Pt wire counter electrode qty. 3
- Gold working electrode qty. 1
- GC disc 5mm with concentric Pt ring rotating ring disk electrode with theoretical collection efficiency $\geq 24.9\%$ qty. 1
- Hg/HgO electrode
- H-Cell with membrane filter for CPE

RRDE Cell Accessory: Qt. 1

- A 300mL or higher total volume three electrode set-up is required with following features:
- Gas tight construction with flangeless fittings
- A combination of chemically inert and organic solvent resistive materials including Teflon lid,
- Ag/AgCl reference electrode 1 no, Pt wire counter electrode 1 no. Suitable Lid for the cell.

Technical Specifications of Channel 2:

- System should be able to perform potentiostatic, galvanostatic as well as bipotentiostatic measurements and impedance in two working electrodes in a single cell
- DC-Potential range ± 4.000 V
- Current ranges ± 1 nA to ± 10 mA (multiple ranges)
- Maximum measurable current ± 40 mA
- Voltage ranges ± 100 mV to ± 1 V
- Rise time 20 μ s
- Applied Potential Resolution 1 mV
- Measured Potential Resolution 0.102% of potential range
- Potential Accuracy ± 0.2 %
- Measured Current Resolution 0.025% of current range
- Applied Current Resolution: 0.1% of current range
- Current Accuracy ≤ 0.05 % of current range at 100nA to 10 mA
- EIS frequency range of 1mHz to 1MHz with 1° phase accuracy & 1% measured impedance accuracy
- AC amplitude range 1mV to 0.35V rms

Software

Linear Sweep Voltammetry, Cyclic Voltammetry, Square Wave Voltammetry, Differential Pulse Voltammetry, Normal Pulse Voltammetry, Differential Normal Pulse Voltammetry, AC Voltammetry, Linear Polarization Resistance, Linear Sweep Potentiometry, Cyclic Potentiometry, Potentiometric Detection (galvanostatic), Fast Potentiometry (tint < 0.1s), Zero Current Potentiometry, Potentiometric Stripping Analysis (galvanostatic), Potentiometric Stripping Analysis (faradaic), Multipulsed Potentiometric Detection, Amperometric Detection, Fast Amperometry (tint < 0.1 s), Pulsed Amperometric Detection, Zero Resistance Amperometry, Multipulsed

Amperometric Detection, Coulometric Detection, Fit and simulation, Nyquist, Bode, Lissajous, Time domain, Frequency domain

Computer Station:

A suitable branded Computer for system control & data acquisition should be offered with the system. It should have following minimum specs: CPU Intel Core i5, RAM 8 GB RAM, HDD 500 GB, GPU DirectX 9.0c compliant display adapter with 1GB RAM. Software should be freely upgradable in future.

Technical Specification of UV-VIS Spectrophotometer

- Dual beam UV/Vis spectrophotometer with central PC control using Windows 10/11 operating system. Full wavelength range of the instrument to be covered using a single light source.
- Light Source: Single source **pulsed Xenon lamp**. Room light immunity to carry out measurements in open sample compartment Condition also.
- Monochromator: should have **Czerny-Turner** or equivalent with focal length 0.25 m or more.
- Detector: **Dual silicon diode** detectors required or better detector.
- **Spectral bandwidth: 1.5 nm** or better.
- Stray light (%T): < 0.05 % at 220 nm and 370 nm or better.
- Wavelength range: < 0.05 % at 220 nm and 370 nm or better.
- **Wavelength accuracy: ± 0.5 nm @ 541.9 nm** or better
- **Wavelength range: 190-1100nm** or better.
- Photometric accuracy (Abs): ± 0.005 at 1.0 Abs or better.
- Photometric range: **± 4 Abs or better.**
- Scan speed >24000 nm/min or better.
- Maximum data collection rate required: 80 (points per sec) or better.
- Accessories: 10 mm standard cell holder
- Software: Must provide unlimited display boxes, retrieve data files and associated Methods with graphics, Options to be provided for Grids, multiple Line types, Points, Legend, must be possible to overlay scans, must be possible to add extra information to graphical display to enable identification of the sample e.g. sample label, chemical structures. These are to be saved with the data file. Calibration curve should be with Linear, Linear direct and Quadratic curve fits required. Scanning software must be there as standard. Must allow unlimited storage of Baseline scans for retrieval and re-use at any time.

Appropriate branded Computer to be supplied.

Previous Records:

- (1) The supplier should provide a list of current users (with contact no. Email address etc) for the quoted item in India (enclose full list of users in India). Vendor should have a couple of users available in last 5 years in the eastern zone of India.
- (2) Customer satisfaction reports for at least 5 individual users in India should be furnished.
- (3) Supplier should mention their details of service setup that are responsible for after sales support.

Warranty: Warranty should be for three years from the date of installation.

Installation: Free installation and user training at IACS

Please SUBMIT ITEMIZED QUOTES with separate pricing for each accessory.

Technical compliance chart should be provided following format:

Sr. No	Tender specification	Your offered instrument specification	Extent of compliance
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Tender will not be accepted if the technical compliance chart is not provided following the above format.

2. PRICE BID:

The price bid indicating (item-wise) price for the item(s) mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as ‘**Price Bid**’ on the outer cover of the envelop as already detailed above. Price bids of only technically qualified bidders will be opened and they will be intimated the date and time of the opening of price bid at their e-mail ids. Rest of the bidders will stand rejected.

PRICE: Price to be quoted based on delivery at the site of installation.

3. BID SECURITY:

1. An Account payee Demand Draft/Pay Order for Rs. 50000 (fifty thousand only) drawn in favour of “Indian Association for the Cultivation of Science” is to be furnished by the bidders except those who are registered with the Central Purchase Organizations, National Small Industries Corporation or the concerned Ministry or Department, as Bid Security money or Earnest Money Deposit (EMD).
2. The Demand Draft for the Bid-Security should have at least 90 (ninety) days validity period of opening of the bids.
3. In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.

4. PERFORMANCE SECURITY:

An Account Payee Demand Draft of 10% of the order value in the name of “Indian Association for the Cultivation of Science” is to be furnished by the successful bidder as Performance security. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security will be refunded to successful bidder on receipt of the Performance security money.

(C) GENERAL INSTRUCTIONS:

1. Validity of tender: Tender submitted should remain valid for at least six months from the date of opening the tender. Validity beyond six months from the date of opening the tender shall be by mutual consent.
2. The tender should accompany a compliance chart.
3. The rate should be inclusive of all taxes, transportation etc. Nothing will be paid in addition to the quoted rate.
4. Incomplete and conditional tenders as well as tenders received after the due date will be summarily rejected without assigning any reasons thereof.
5. At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The amendment(s) will be notified on the institute website. Prospective bidders are advised to occasionally visit the website (www.iacs.res.in/tender) for any amendment.
6. Payments: 100% against delivery and successful installation.
7. Warranty: Minimum three years
8. Installation/Demonstration/Application training at site: Installation & user training at IACS, free of cost by the supplier.
9. Service facility: In Kolkata, supplier should mention their details of service setup and man powers who are responsible for after sales support. Response time should be within 24 hrs.
10. The model number, make and a printed literature of the product shall submit positively.
11. Proposed delivery schedule should be mentioned clearly.
12. Manufacturers / exclusive distributors / vendors should have history of supplying this type of instruments to this or other scientific organizations.
13. Authorized dealership certificate should be provided in case of principal manufacturing company is not quoting directly.
14. Guarantee certificate, users' manuals etc. are to be handed over to the user after successful commissioning of the system.
15. In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of the technical bids will be the following working day at the appointed time.
16. In case of any dispute, the decision of IACS authority shall be final and bidding on the bidders.
17. For any clarification regarding technical specifications, information etc., please send your queries to Prof. Tapan Kanti Paine (E-mail: ictkp@iacs.res.in).
18. The authority of IACS reserves the right to reject any or all of the tenders received without assigning any reason thereof.

REGISTRAR