केरल केंद्रीय विश्वविद्यालय
CENTRAL UNIVERSITY OF KERALA
(संसद के अधिनियम, वर्ष 2009 द्वारा स्थापित / *Established under the Act of Parliament in 2009)*
तेजस्विनि हिलस, पेरिये डाक, कासरगोड-671316, केरल / Tejaswini Hills, Periye P.O.
KASARAGOD-671 316, KERALA
दूरभाष/ Phone: 9544576234, वेबसाइट/ Website:- cukerala.ac.in, ई-मेल / E mail:
bhagiyalakshmi@cukerala.ac.in

Reference No. CUK/PUR/DST/WTC/Equipment/2025-(2) **15.10.2025**

INVITATION FOR QUOTATIONS

Quotations are invited from the reputed and well-established manufacturers/suppliers for the supply and installation of Bi-Potentiostat With Rotating Ring Disk Electrode Apparatus With Purge & Stir Facility Sanctioned by Department of Science & Technology, Climate, Energy and Sustainable Technology (CEST)as detailed below:

Sl. No.	Brief description of work	Quantity
1	Bi-Potentiostat With Rotating Ring Disk Electrode Apparatus With Purge & Stir Facility	1

The detailed technical specifications of the Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility shall be provided as per the **Annexure I**. General Terms and Conditions for submitting quotations and supplying the Study Tables shall be as per **Annexure - II**.

The quotations shall be submitted through email bhagiyalakshmi@cukerala.ac.in or through postal address as mentioned below. It is requested that the quotations along catalogs, if any, may be submitted. The quotations will be opened on ***30th October, 2025 at 05.00 Hrs***. If the proposed day happens to be holiday for CUK, the quotations will be opened on subsequent working day.

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Dr. M. Bhagiyalakshmi
Assistant Professor
Department of Chemistry
Central University of Kerala
Sabarmathi building, Tejaswini hills, Periye PO
Kasaragod District
Kerala—671 325, INDIA
Mobile: 09544576234
E-mail: bhagiyalakshmi@cukerala.ac.in

Annexure-I

TECHNICAL SPECIFICATIONS OF Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility

Technical Specification for "Electrochemical Workstation with Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility"

Project Fund Source: DST-CEST
Project No. DST/WTC/2K23/2023/761(C)

1. Bi-Potentiostat/Galvanostat/Impedance analyzer

- Number of required Channels: 2
- Electrode configuration, connections: 4 or more
- Floating mode and IR compensation: Required
- Current range: 3nA – 250mA or more
- Applied current accuracy: 20pA
- Input bias current: < 20 pA,
- Compliance Voltage: ±10V or more, Potentiostat rise time: 0.6 us
- Maximum potential: ±10V or more
- Potential noise: < 10 µV rms or better
- Measured current Potential: Current Resolution: <0.005% or better
- Potential accuracy: ±1 mV or better
- EIS Frequency range: 10µHz to 1MHz ; IMP amplitude: 0.00001V to 0.7V RMS or better
- Operate two channels simultaneously with CV/LSV scan rate: 0.000001 to 10,000 V/s; CA and CC pulse width: 0.0001 to 1000 sec or better
- Pico Amp booster for Low current measurements.

2. Equipment should support the following techniques.

a) Sensor/Battery/Fuel cell/impedance Techniques

- Cyclic Voltammetry (CV) with simulation/fitting programs
- Linear Sweep Voltammetry (LSV) with stripping
- Bulk Electrolysis with Coulometry (BE)
- Chrono Amperometry (CA)
- Chrono Coulometry (CC)
- AC Voltammetry (ACV) with stripping
- Differential Normal pulse Voltamemtry (DPNV) with stripping
- Second Harmonic AC Voltammetry (SHACV) with stripping
- Galvanostatic Intermittent Titration Technique (GITT)
- Potentiostatic Intermittent Titration Technique (PITT)

- Differential Pulse Amperometry (DPA)
- Double Differential Pulse Amperometry (DDPA)
- Triple Pulse Amperometry (TPA)
- Integrated Pulse Amperometry Detection (IAPD)
- Hydrodynamic Modulation Voltammetry (HMV)
- Sweep-Step Functions (SSF)
- Chronopotentiometry with Current Ramp (CPCR)
- Potentiometric Stripping Analysis (PSA)
- Staricase Voltammetry (SCV) with stripping
- Auxiliary Signal Measurement Channel
- RDE control (0-10V output)
- IR Compensation
- Galvanostatic Charge discharge single/multiple cycle -Chrono Potentiometry (CP) with potential limits, polarity by potential or time, no. of cycles etc
- Voltage vs current density curves
- Multi-Potential Steps (STEP)
- Multi-Current Steps (ISTEP)
- Amperometric i-t Curve (i-t) – Lifetime testing
- Polarisation I-V Curves Linear Sweep
- Open Circuit Potential – Time (OCPT)
- Differential Pulse Voltammetry (DPV) with stripping
- Normal Pulse Voltamemtry (NPV) with stripping
- Square Wave-Osteryoung Voltammetry (SWV) with stripping
- Tafel Plot (TAFEL), potentiodynamic deactivation, pitting corrosion, corrosion rate, linear Polarisation, Corrosion current etc.
- I-V measurements, I max, Pmax, Fill factor etc

b) <u>Impedance</u>

- AC Impedance (IMP)
- Impedance – Time (IMPT) (Mott-Scottsky)
- Impedance – Potential (IMPE)
- Impedance Simulator with fitting
- Open Circuit Potential – Time (OCPT)

3. <u>Software Features: Windows-based software for data processing</u>

a) Impedance simulation and fitting programs should be supported.

- Bode plots [log Z vs log (freq), Phase angle vs log (freq), log Z" & Z' vs log (freq), log Y vs log (freq)]
- Nyquist; Z" vs Z', Interactice 3D Plots, Admittance; Y" vs Y'
- Warburg: Z" & Z' vs $w^{1/2}$ w-angular frequency, Z' vs w Z", Z' vs Z"/w, Cot (phase) vs $w^{½}$

b) Graphic Display

- Present data plot, 3D surface plot: Overlay plots: several sets of data overlaid for comparison, add data to overlay: adding data files to overlay plot, parallel plots, etc.
- Upgradation of the software will be done once a year or as soon as updated versions of the software are available.

- Accessories for Bi-Potentiostat: Electrochemical Cell System includes, Glass cells with Cell top; Pt Working Electrode; GC Working Electrode; Ag/AgCl Reference (aq)-3 No's; Ag/AgCl Reference (non aq); Calomel Reference Electrode-3 No's; Pt Wire Counter Electrode; Electrode Polishing Kit & Cell Stand

4. Rotating Ring Disk Electrode Apparatus setup:

The RRDE system should integrate with purge and stir capabilities. It supports the simultaneous use of disks and rings as working electrodes.

- Operatable as RDE (Rotating Disk Electrode) and RRDE (Rotating Ring Disk Electrode) systems
- The rotating speed : >6000 rpm (error < 0.1%)
- The main motor shaft unit, glass cell, and working electrode are easily replaceable.
- Integration of control unit and rotator
- Ring/Disk insulation resistance: > 10 M ohm
- Electrode to lead pin contact resistance: 5 ohms
- Operating temperature: 10 to 50 °C
- Inlet gas pressure: 5 psi (34 KPa)
- It should be controlling the rotation speed through the electrochemical workstation software. Software should have sent the command to the RRDE/RDE system to control the rotation speed.
- Accessories for RRDE: Pt counter electrode 23cm Pt; Reference Electrode Ag/AgCl; RRDE Pt Ring/GC Disk Electrode : Ring: OD:7mm, ID:5.mm, RDE GCE Glassy carbon disk electrode ID:5mm, suitable glass cell (100 ml), and electrode and cell assembly kit.

5. <u>Warranty</u>: 3 years or more

6. <u>Installation and Training:</u>

- Delivery and Installation with company engineer
- Training should be provided to the students & staff who will be operating the system.

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GENERAL TERMS AND CONDITIONS OF TENDER

1. Authorized Manufacturers/Suppliers shall submit quotations through email and or directly to Dr. M. Bhagiyalakshmi, PI, DST Project, Assistant Professor, Department of Chemistry, Central University of Kerala, Periya, Kasargod – 671320 on or before the due date 30.10.2025 (05:00 p.m.). bhagiyalakshmi@cukerala.ac.in
2. Submitting the spot quotation by any other means other than specified above shall not be considered. The University is not responsible for any postal/courier delay.
3. The invitation notice, technical specifications of the Electrochemical Workstation Bi-Potentiostat With Rotating Ring Disk Electrode Apparatus With Purge & Stir Facility can be seen and downloaded from the University official website **https://cukerala.ac.in/**.
4. The supplier should be a well-established professional organizer and must have an experienced background in manufacturing and supplying the mentioned equipment to Universities and educational institutes.
5. The bidder shall submit Registration certificate, PAN, AADHAR and GST certificates.
6. The quoted price must be in Indian rupees and shall include income tax, GST, service tax, duties, transportation of materials etc. and no additional claim will be entertained by the University in this regard. Installation of mentioned equipment shall be completed at free of cost within 60 days from the date of supply order to Dr. M. Bhagiyalakshmi, PI, DST Project, Assistant Professor, Department of Chemistry, Central University of Kerala.
7. The bidder shall comply with all the technical specifications of the Electrochemical Workstation Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility and any deviation invites disqualification from the competition.
8. The successful bidder shall be required to comply with all the instructions of the University. The Central University of Kerala decision is final.
9. The Delay in supply of Electrochemical Workstation Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility will invite Liquidated Damage charges as per GFR, Govt. of India rules. Date of supply shall be considered for calculating the LD charges. University decision is final in this regard.
10. The warranty for the supplied Electrochemical Workstation Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility shall be minimum THREE year or more from the date of supply/installation.
11. **Selection of a bidder is decided based on the evaluation of technical specifications of the** Electrochemical Workstation Bi-Potentiostat With Rotating Ring Disk Electrode Apparatus With Purge & Stir Facility **and offer price (lowest price, L1). However, the University reserve the right to place purchase orders to the L1 supplier.**
12. **The L1 bidder shall supply the** Electrochemical Workstation Bi-Potentiostat With Rotating Ring Disk Electrode Apparatus With Purge & Stir Facility **within 60 days from the date of issuing the purchase order.**

13. Along with the Electrochemical Workstation Bi-Potentiostat with Rotating Ring Disk Electrode Apparatus with Purge & Stir Facility, the successful bidder is expected to submit original GST bills in triplicate clearly indicating all taxes and total price with delivery challans.
14. To ensure due performance of the contract, *Performance Security* is to be obtained from the **successful bidder** awarded the supply order. Performance Security in respect of procurement of **equipment** should be for an amount of **three to five per cent (3–5%)** of the value of the equipment.
15. Payment (100%) shall be released after supply and successful installation of the mentioned equipment. Payment is also subject to the satisfactory report of the Committee/end user of the University. Payment shall be released to the supplier within 30 days from the date of successful installation. However, the Competent Authority of the University may consider part payment only after supplying items to the University.
16. University shall recover the income tax, GST, surcharge, and work contract tax or any other statutory taxes if levied in by the Government.
17. The bidders must ensure that all the submitted hard copy of the documents should be of good quality. Vague /poor quality of printed documents and incomplete documents will not be accepted. All the submitted documents shall be only English language.
18. The rates should be firm throughout the currency of the contract and no increase will be considered by the Central University of Kerala.
19. The University reserve the right to add any terms and conditions to the above while issuing purchase order.