

SCANNING ELECTROCHEMICAL MICROSCOPE (SECM)

Critical Components	Specification	Supplier's specification
General	The SECM should be a bench top design. Instrument should be provided with all required components such as bipotentiostat, a galvanostat, a 3D nanopositioner including XYZ stages, a combination of micro-step stepper motors and a closed-loop piezo. A sample holder with two types of cell with Pt wire counter electrode mounted, two reference electrodes, two Pt disk substrate electrodes, and 10 μ m Pt disk probe.	
	Original or Printed literatures should be attached with tender document. Quotation will be rejected if all requested specifications are not highlighted and tagged on the printed literature for easy reference. If the requested specifications are not given in the manufacturers' literature, a certified supporting letter should be supplied from the manufacturer for the confirmation.	
Bipotentiostat	Should additionally support for hydrodynamic voltammetry and spectroelectro-chemical measurements.	
	Potential Range: minimum of ± 10 mV, ± 10 V	
	Current ranges: 0.1 nA or lower to 0.1 A	
Galvanostat	Galvanostat applied current range: 5nA – 0.1A	
Electrometer	Reference electrode input impedance: 0.1nohm or lower	
	Reference electrode input bandwidth: 10 MHz	
Waveform Generation and Data Acquisition	Fast data acquisition	
	iR compensation facilities	
	Maximum image array: 500 x 500 x500 CV simulation and fitting program, Impedance simulation and fitting program.	
AC Impedance analyzer	The frequency range should be 1.0 μ Hz or 10 μ Hz to 1M Hz. Nyquist plot and Bode plot as well as some other plots including 3D plot should be available. Data must be able to present in the form of Nyquist, Bode, Admittance, Dielectric, Mott-Schottky and the probe should scan or image impedance.	

Voltammetry	<p>Cyclic and linear voltammetry: potential scanning should be in the range 10^{-4} to $10^4 \frac{V}{s}$. Facilities for the following operational modes should be available</p> <p>Staircase Voltammetry (SCV), Chronoamperometry (CA) Chronocoulometry (CC), Differential Pulse Voltammetry (DPV), Normal Pulse Voltammetry AC Voltammetry (ACV), Amperometric i-t Curve (i-t), Differential Pulse Amperometry (DPA), Bulk Electrolysis with Coulometry (BE)</p>	
Software Features	<p>Windows-based software</p> <p>Run, macro, iR compensation, filtering, RDE control, preconditioning, step functions, and cell control</p> <p>Data plot, overlay and parallel plots, x-y plot, ip~v plot, ip~v 1/2 plot, Ep~log v</p> <p>Smoothing, derivatives, integration, semi-derivative and semi-integral, interpolation, baseline fitting & subtraction, linear baseline correction, data point removing, data point modification, background subtraction 3D interactive plots for SECM image</p>	
Sample cell and working electrodes for CV	3 mm diameter Glassy Carbon Working Electrode (3-pack)	
	2 mm diameter Platinum Working Electrode	
	10 µm diameter Platinum Microelectrode	
Reference and counter Electrodes	Ag/AgCl Reference Electrode w/ porous Teflon Tip (3-pack)	
	Non-Aqueous Ag/Ag+ Reference Electrode w/ porous Teflon Tip	
	Platinum Wire Counter Electrode 10 µm diameter Platinum SECM Tip	
Electrode Polishing kit	Aluminar powder (0.05 micron), polishing pad, diamond polishing pad	

Other specifications		
Warranty	One (1) year comprehensive warranty after satisfactory installation and commissioning of the instrument.	
	Post-warranty maintenance cost should be quoted separately.	
Other Requirements	Instrument should be fully workable system and if any other accessory required for the operation of the instrument, supplier must quote all required accessories	
	Rotating ring disk electrode apparatus and required accessories	
	Manufacture should agree to provide spare parts at least 10 years after installing the instrument	
Documentations	Bidders should have established after sales service and minimum of 10 year experience for supply and maintaining similar type of instruments. Supplied instrument list should be attached with tender document for 10 years. Type of instrument supplied, institute name and end user with contact details should be clearly mentioned.	
	Operational manual and Method manual should be submitted in the installation of the instrument.	
	Bidders should submit documentary evidence for company registration, year of company registration, Number of staff (In the payroll and EPF paid), and experience of after sales staff.	
	Bidders should submit documentary evidence for working capital of past 3 years and should have positive working capital for last 3 years.	

PC computer with Windows 98/NT/Me/2000/XP/Vista/7 Laser printer, 20 KV a UPS or manufacture recommended power protection system and 21” HD-LCD monitor	
Should be provided with all required components for Simultaneous spectroelectro-chemical measurements of the cyclic voltammetry and absorbance as well a constant potential electrolysis measurement.	

Rotating Ring Disk Electrode Apparatus (RRDE)	System should be supplied with Rotating Ring Disk Electrodes	
	Rotation speed should be varied between 100 and 6,000 rpm	
	Facility for operating temperatures 20 to 50 °C The RRDE operating voltage should be either 220V /230V (50-60 Hz)	
	Sample vial (100mL), Spin coating adapter	
	RRDE Pt Ring/Pt Disk Electrode, RRDE GC Ring/GC Disk Electrode, RDE/Pt, RDE/GC	
	Should be supplied with Rotation remote control cable and Purge remote control cable	
	Platinum counter electrode 23 cm	
	O-ring for RRDE Bearing assembly, 10pcs	

UV/Visible electro spectroscopy	UV/VIS Electro spectrometer unit: wavelength range should cover between 150 nm to 700 nm, should compatible with the potentiostat provided with SECM
	Spectroelectrochemical batch type Quartz Glass cell including electrodes: should be able to carry out aqueous and nonaqueous electrochemistry as well. The optical path length should be 1.0 mm, Pt counter electrode, Pt/GC working electrode, Ag/AgCl aqueous and nonaqueous reference electrodes, Purging tube 10 cm and Teflon Cap