Specifications for Impedance and dielectric analyzer

1. Electrochemical Impedance and Dielectric analyzer:

Dielectric analyzer specifications:

Frequency range	: 10uHZ- upto 30 MHz,
Frequency Resolution	: 0.015 PPM
Accuracy	: 0.1%, 0.1° accuracy.
AC Amplitude	: upto 3V rms and 0-60mA rms
Resolution	: 1mV and 100uA
Impedance measurement	: 100 mohms to 100 MOhms

- Min capacitance, inductance and impedance range; 0.1F , 1kH & 100MOhms
- Input channel Resolution: 1uV for voltage, 200pA for current
- Frequency Sweep : Logarithmic, linear, AC/DC Voltage, AC/DC Current
- DC Bias range : +/- 40V and +/- 100mA
- Current measurement : 1fA to 100mA

Impedance range:

- 100mΩ to >100TΩ…upto 100TOhms should support upto 10Mhz freq renge or better.
- Accepted Accuracy level: 0.2% upto 1Mhz , 5% or lesser from 1Mhz-10Mhz range, 10% or lesser above 10Mhz to 30Mhz range.
- Capacitance range 1pF to >0.1F
- Tan delta range < 10^-4to 10^3 (reference mode)
- Provide detailed contour map for every freq. and impedance range
- compatible with 2 and 4-terminal measurement configurations
- Separate real time parallel current and voltage analyzers should be provided for exact V/I measurement.

DC & EIS specifications:

- Instruments support Electrochemical Impedance spectroscopy – 2,3 and 4 electrode mode - electrode method measurement from 1uHZ to 1Mhz with min- 0.1 to 1V rms
- Voltage & current compliance: 12V and 600mA or better. Please quote upgradable option for Higher current measurement.
- Voltage & current resolution: min 500nV and 200fA or better

Software capability required for :

- Capability to apply and measure- DC Voltage and current along with AC sine wave
- Should be able to Sweep Freq, Amplitude in both current and voltage mode.
- Should be able to sweep DC voltage and current
- Gain, phase, group delay and impedance measurements should be possible.
- Displays a,b,r,q,t,Z,R,X,Y,G,B,L,C,Q,D,D%
- Z*, Y*, ε*, C*, tan delta, DC bias, temperature should be measured and displayed against any of these parameters on Bode & Complex plane
- Equivalent circuit/modeling techniques for detailed analysis of results.
- Software have comprehensive synchronized control on instrument and temperature controller data acquisition.
- Detailed equivalent circuit modelling analysis – simulation, fitting , sbstraction and batch fitting mode.
- Software should be capable to calculate tan delta, epsilon, permittivity, relative permittivity, Impedance, admittance and other related parameters instantly.
- Null, normalize and auto-impedance modes
- Cyclic voltammetry, CA,CP,CC,SWV,ECN,Potentiostat EIS, Galavanostat EIS, Mott-Schottky, Charge –Discharge with respect to Vol, current and power.

Accessories required:

- Specimen holder for Dielectric measurement – for both Soild and liquid state.
- Specimen dia 10mm 20mm – 2nos.
- Speciemen holder should be compatible to work in humidified condition.
- 3 electrode cell kit with Pt. counter, Ag/Ag Cl ref and working electrode
- Suitable data acquisition system with printer – 2 nos.
- Temperature Range: 30 to 500 °C or above with a resolution of + 5°C Heating chamber with complete isolation.Furnace unit can have the facility to interface with the impedance/dielectric interface Should have Eurotherm controller to control from the computer Atleast one thermocouple to monitor temperature at sample holder **(quote separately)**

Optional Accessories:

- High temp specimen holder for working temp from R.T to 800°celcius with complete facility for pellet type specimen holder ranging from 12mm to 24mm.