EC-110

Electrochemical workstation



Product Introduction

EC-110 is a high-precision and high-stability single-channel electrochemical workstation, specifically designed for basic electrochemical research, electroanalysis, electrocatalysis, electrosynthesis, and experimental teaching scenarios. It meets the full range of needs in scientific research and teaching with its ultimate measurement accuracy, stable hardware performance, and flexible software ecosystem.

Product Features

→ Stable system, precise measurement

The current noise is only at the pA level, allowing the detection of weak currents at the 10pA level, making it suitable for high-precision electrochemical analysis scenarios

→ Wide-range automatic current setting

The current range spans from 1nA to 250mA, supporting fully automatic range switching

→ A comprehensive iR compensation mechanism

Supports positive feedback and dynamic iR compensation, enhancing the accuracy and reproducibility of test data

→High-speed acquisition and stable transmission

Equipped with 16-bit @ 1 MHz or 16-bit @ 3 MHz AD acquisition, USB2.0 high-speed communication interface, ensuring real-time and integrity of data


Chemistry


Biology


Environment


Material


Energy

Product model and functional configuration

Function Configuration	Model		
	EC-110	EC-110 Plus	EC-110 Pro
Cyclic voltammetry (CV)	●	●	●
Linear Sweep Voltammetry (LSV)	●	●	●
Step-sweep voltammetry (SCV)	×	×	●
Tafel diagram (TAFEL)	×	●	●
Chronoamperometry (CA)	●	●	●
Chrono-Coulometry (CC)	●	●	●
Differential pulse voltammetry (DPV)	×	●	●
Normal Pulse Voltammetry (NPV)	×	●	●
Differential normal pulse voltammetry (DNPV)	×	×	●
Square Wave Voltammetry (SWV)	×	×	●
Alternating Current (including phase sensitive) Voltammetry (ACV)	×	×	●
Second harmonic alternating current (phase sensitive) voltammetry (SHACV)	×	×	●
Fourier Transform Alternating Current Voltammetry (FTACV)	×	×	●
Current-time curve (i-t)	●	●	●
Differential pulse amplitude detection (DPA)	×	×	●
Double Differential Pulse Amplitude Detection (DDPA)	×	×	●
Three-pulse Amperage (TPA)	×	×	●
Integral Pulse Amplitude Detection (IPAD)	×	×	●
Controlled potential electrolysis coulometry (BE)	●	●	●
Hydrodynamic Modulation Voltammetry (HMV)	×	×	●
Scan-Step-and-Fuse (SSF) method	×	×	●
Potentiostatic Intermittent Titration (PITT)	×	×	●
Impedance measurement (IMP)	×	●	●
AC impedance measurement (constant current control)	×	×	●
Impedance-measurement over time (IMPT)	×	●	●
Impedance-Potential Measurement (IMPE)	×	●	●
Chronopotentiometry (CP)	●	●	●
Current scanning chronopotentiometry (CPCR)	×	×	●
Multiple current step method (ISTEP)	●	●	●
Galvanostatic Titration Technique (GTT)	×	×	●
Potentiometric stripping analysis (PSA)	×	×	●
Electrochemical Noise Measurement (ECN)	×	×	●
Open-circuit potential-time curve (OCPT)	●	●	●
Constant current instrument	●	●	●
RDE control (0-10V output)	×	×	●
Arbitrary reaction mechanism CV simulator	×	×	●
Preset reaction mechanism CV simulator	●	●	●
Digital simulator and fitting program for AC impedance	×	●	●

Product Parameters

Potentiostat Specifications	
Item	Parameter
Maximum potential range	±10 V
Maximum current	±250 mA continuous; ±350 mA peak
Compliance voltage	±13 V
Potentiostat rise time	<1 μs, typically 0.8 μs
Potentiostat bandwidth (−3 dB)	3 MHz
Applied potential ranges	±10 mV, ±100 mV, ±1 V, ±10 V
Applied potential resolution	≤0.0015% of the potential range
Applied potential accuracy	±1 mV; ±0.1% FSR
Applied potential noise	<10 μV RMS
Measured current range	±10 pA to ±0.25 A, 10 ranges
Measured current resolution	0.0015% of the current range
Current measurement accuracy	0.2% at current sensitivities from $1\times10^{-3}$to 1×10^{-7} A/V; 1% for other ranges
Input bias current	<10 pA
Galvanostat Specifications	
Item	Parameter
Applied current range	3 nA–250 mA
Applied current accuracy	0.2% for currents above 3×10^{-7}A; 1% for other ranges; ±20 pA
Applied current resolution	≤0.03% of the current range
Measured potential range	±10 V
Electrometer Specifications	
Item	Parameter
Reference electrode input impedance	$1\times1012^{\Omega}$
Reference electrode input bandwidth	≥25MHz
Reference electrode input bias current	≤10pA@25°C
Waveform Generation and Data Acquisition	
Item	Parameter
High-speed waveform generation update rate	100 MHz, 14-bit resolution
High-speed data acquisition	better than 16-bit resolution; simultaneous dual-channel sampling at 3 million samples per second
Maximum sampling rate of the external signal recording channel	≥1 MHz

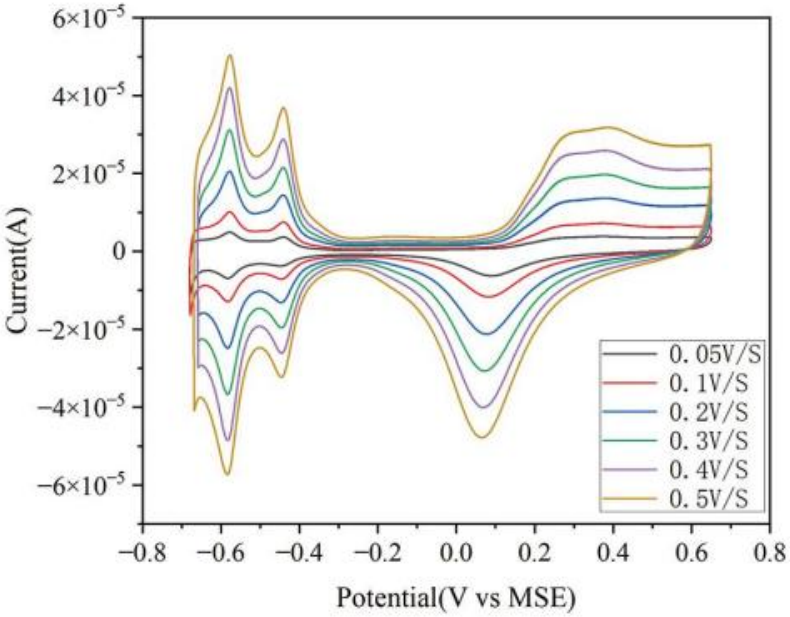
Product Parameters

Additional Experiment Specifications	
Item	Parameter
CV and LSV scan rate	0.000001–10,000 V/s
Potential increment during scanning	1 mV at a scan rate of 1,000 V/s
CA and CC pulse width	0.0001–1,000 s
Minimum CA sampling interval	M ≤0.4 μs
Minimum CC sampling interval	≤0.4 μs
DPV and NPV pulse width	0.001–10 s
SWV frequency	1–100 kHz
Minimum current–time (i–t) sampling interval	0.4 μs
ACV frequency range	1 Hz–100 kHz
SHACV frequency range	0.1–5 kHz
FTACV frequency range	0.1–50 Hz; simultaneous acquisition of ACV data for the fundamental and second through sixth harmonics
Electrochemical impedance spectroscopy (EIS) frequency range	0.00001–1 MHz
EIS excitation amplitude	0.00001–1.4 V RMS

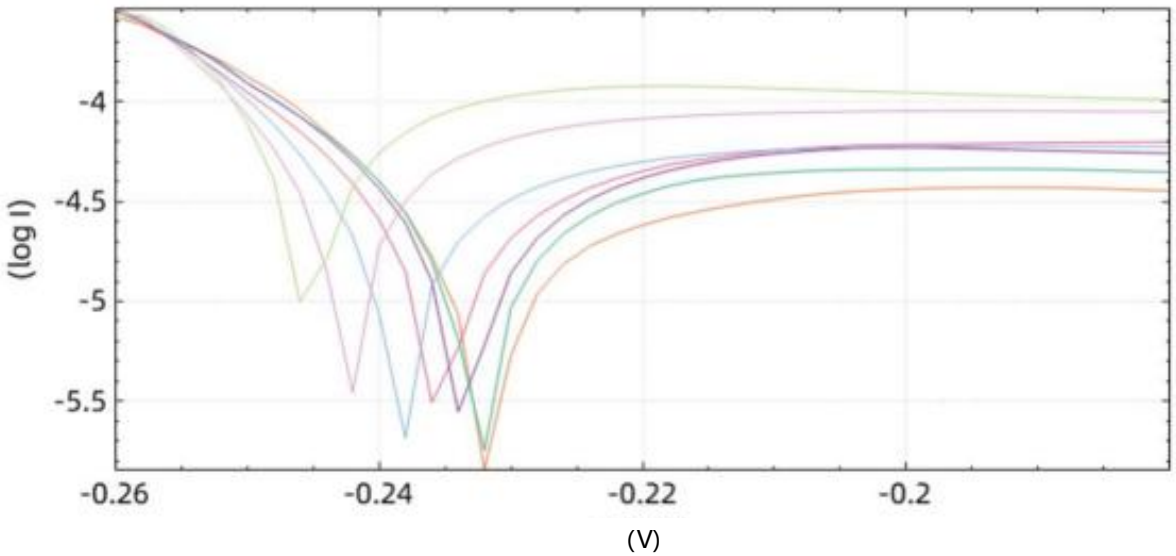
Test Methods

Category	Selected Methods
EIS	PEIS / GEIS
Transient Polarization	STEP – Multi-Potential Steps
Steady-State Polarization	OCP – Open-Circuit Potential / Tafel plots – Potentiodynamic Scan
Chronoanalysis	CP – Chronopotentiometry / CA – Chronoamperometry / CC – Chronocoulometry
Voltammetry	LSV – Linear Sweep Voltammetry / CV – Cyclic Voltammetry / SWV – Square-Wave Voltammetry / DPV – Differential Pulse Voltammetry / NPV – Normal Pulse Voltammetry

Application Experiment



Characterization of hydrogen adsorption and desorption behavior on Pt surface by cyclic voltammetry



Test Tafel curve analysis for exchange current density and reaction kinetics