

Coulometric Karl Fischer Moisture Titrator With Integrated Headspace Oven For Battery Materials

Item Number: DS08



Introduction

Engineered for advanced battery materials research, this integrated coulometric Karl Fischer moisture titrator delivers high-precision trace moisture analysis from 1 ppm to 100% with automated headspace heating, intelligent drift compensation, and robust data governance for quality control laboratories.

[Learn More](#)

Application	Description	Key Benefit
Lithium Battery Coated Electrodes	Headspace thermal extraction of residual water trapped within dried positive (cathode) and negative (anode) electrode coatings.	Prevents active material delamination and parasitic side reactions during cell cycling with rapid 5-minute automated testing.
Non-Aqueous Battery Electrolytes	Direct liquid injection coulometric titration of organic carbonate solvents and lithium salts (e.g., LiPF ₆).	Detects trace moisture down to single-digit ppm levels in under two minutes, avoiding hydrofluoric acid (HF) generation and electrolyte degradation.
Battery Separator Membranes	Thermal extraction analysis of microporous polyolefin (PE/PP) and ceramic-coated separator films using sealed 10 mL vials.	Ensures complete moisture liberation without melting the polymer structure, maintaining internal cell electrical isolation integrity.
Cathode Active Materials & Precursors	High-temperature moisture desorbing for lithium cobalt oxide (LiCoO ₂), NCM/NCA ternary powders, and lithium iron phosphate (LFP).	Provides high precision across variable sample masses with automated blank subtraction, guaranteeing consistent cathode synthesis quality.
Solid-State Electrolyte Powders	Trace moisture characterization of sulfide, oxide, and halide solid electrolytes under inert carrier gas conditions.	Prevents moisture-induced toxic gas generation (such as H ₂ S) and degradation of ionic conductivity in next-generation solid-state batteries.
Battery Slurry Binders & Additives	Moisture verification of conductive carbon black, PVDF, CMC, and SBR binders before slurry preparation.	Eliminates slurry gelling and agglomeration issues during high-speed coating, ensuring uniform electrode layer density.

Parameter	Specification (DS08)
Measurement Principle	Coulometric Karl Fischer Titration with Integrated Thermal Evaporation Oven
Moisture Measurement Range	3 µg to 199 mg H ₂ O (Mass) / 1 ppm to 100% (Concentration)
Moisture Detection Resolution	0.01 µg H ₂ O
Measurement Repeatability	≥ 99.7% (at 1000 µg H ₂ O calibration standard)
Applicable Sample States	Solid powders, sheets/films, non-aqueous liquids, and specialized gas samples
Sample Introduction Modes	Direct liquid injection, automated vial piercing, and purge cap displacement
Heating Temperature Range	Ambient to 285°C (Adjustable in 0.1°C increments)
Temperature Control Modes	Constant isothermal holding and 3-stage programmable temperature ramping
Maximum Heating Rate	15°C/min (for temperatures up to 200°C)
Carrier Gas Requirements	High-purity dry nitrogen (≥99.99%) or dry compressed air
Carrier Gas Pressure Limits	Inlet: Maximum 0.6 MPa; Regulated Output: 0 to 0.4 MPa
Carrier Gas Flow Control	Electronic display and control: 0 to 100 mL/min

Parameter	Specification (DS08)
Gas Flow Accuracy	1 mL/min
Sample Vial Volume	10 mL standard crimp-top headspace vials
Typical Analysis Duration	50 seconds to 15 minutes (depending on sample matrix and method)
User Interface & Controls	Full-color touchscreen with numeric keypad and one-touch automated start
Data Communication Ports	RS-232 serial port, USB interface, and USB stylus micro-printer output
Power Rating & Supply	300 W; 220 V AC, 50 Hz
System Dimensions (L × W × H)	500 mm × 250 mm × 360 mm
Instrument Net Weight	11.5 kg