Category	*Coulometric Karl Fischer Titrator AQ series*
Electrical/Electronics technologies	**Water in lithium cobalt oxide for lithium-ion battery** by Indirect method (Evaporator + Coulometric KF titrator)
Referenced methods	ASTM E1064, D6304

Key words; secondary (rechargeable) battery, cathode, anode, battery materials,

Outline

Lithium cobalt oxide is an important material for cathode part of lithium-ion rechargeable batteries. Water in lithium cobalt oxide (powder) can be accurately determined by coulometric Karl Fischer titration interfacing with the EV-2000 solid/powder evaporator. By using this heating method, anode in the cell is always kept clean because only water that is evaporated and separated from the sample will be carried into the cell.

Reagents

Anode solution	:	Hydranal® Coulomat AG 100mL
Cathode solution	:	Hydranal® Coulomat CG
Additional solvent	:	Dehydrated methanol 50mL

Recommended configurations

- *KF Titrator :* **AQ-2100S** (High-end, LCD screen)
- *Evaporator*: **EV-2000** Solid evaporator

*Optional Thermal Printer **PR-2000T2** / Dot impact printer **PR-302B**

▲ AQ-2100S + Printer + EV-2000

Procedure

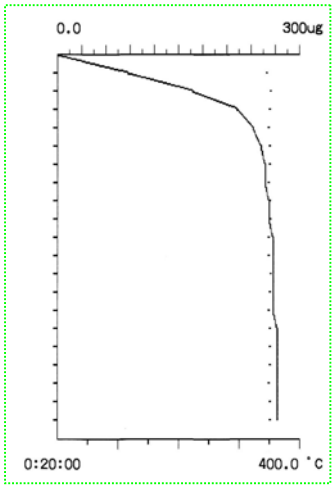
1. Place an aluminum foil cup into the evaporation chamber and set it on the evaporation base.
2. Press F1[EV Start] key on the AQ-2100 to start pre-heating.
3. Press SAMPLE key once the instrument is ready for measurement.
4. Place a sample container, a funnel, and a sampling spoon on the balance, and tare it.
5. Open a glass stopper and introduce about 1g of sample by using the funnel quickly.
6. Close the stopper and press TITRATION key to start titration.
7. Weigh the total weight of the sample vial and other sampling tools again.
   The difference between the total weight before/after sampling shall be the sample size.
6. Press S.SIZE/No. key to input the amount of sample added.

Condition parameters and an example result

Condition file	
Cal Mode	0
Interval Time	20 sec
S-Timer	0 min
T-Timer	0 min
Current	SLOW
Blank Value	0.0 µg
Unit Mode	AUTO
Back Ground	ON
Auto Interval	0.00000 g
Minimum Count	5 µg

EV file	
Step1 Temp.	350
Time	10 min
Pre Heat End Time	10 min
B.G.	0 µg
Cooling Time	5 min
B.G. Count	10
Back Purge Time	5 sec

N_2 Carrier gas flow rate	0.5L/min



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