DEDICATED TO LITHIUM-ION BATTERY TESTING AND DEVELOPMENT

Electrolyte Wetting Measurement System

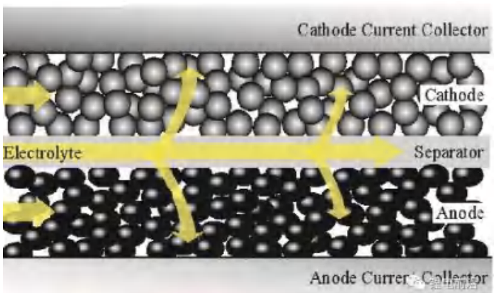
EWS & ETS & CHT

– ANALYTICS BEYOND MEASURE –

A Application

- Electrolyte performance evaluation
- Electrode consistency assessment
- Optimization of material/ electrode surface treatment processes

B Principle of electrode wetting



Effect of electrode compression on the wettability of lithium-ion batteries
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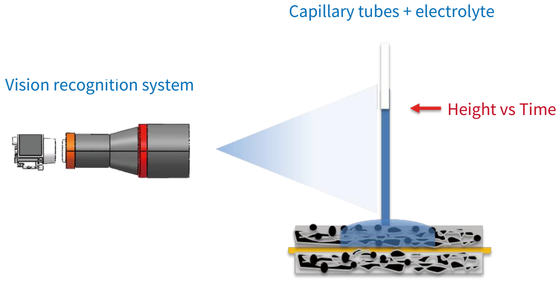
The Lucas-Washburn infiltration model is commonly used to describe the dynamic of liquid absorption in electrode pores, as represented by the equation below. Here, (h) denotes the liquid absorption height, (t) stands for absorption time, (c) represents the shape factor for different pore capillaries, (r) refers to the capillary radius, (cr) is a constant termed as the form radius, (θ) stands for the liquid surface tension, and (η)denotes the liquid viscosity.

$$h^2 = \frac{cr\sigma\cos\theta}{2\eta}t$$

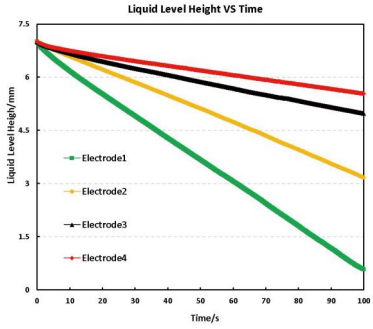
C Electrode electrolyte capillary wetting system

(1) Key Features

1. Equipped with a high-precision vision testing system for stable and efficient testing repeatability.
2.In-situ real-time characterization of electrolyte wetting rate on negative electrode sheets of lithium-ion batteries.
3. Applicable Samples: Negative electrode sheets.
4.The greater the compaction of the electrode sheet, the lower the porosity, resulting in poorer electrolyte wetting.



(2) Application Case:



Comparison of liquid absorption heights for negative electrode sheets with different compaction densities.

Wettability of 4 electrodes with different compaction densities:

1 (1.35g/cm^3) > 2 (1.5 g/cm^3) > 3 (1.6 g/cm^3) > 4 (1.65 g/cm^3)

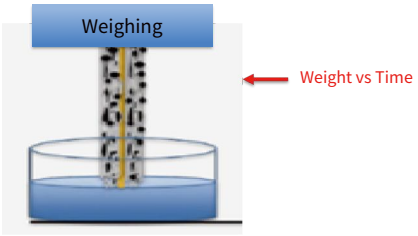
(3) Model and Parameters

EWS1100	
Pressure control range	0~500g
Pressure resolution / Accuracy	0.01g/±0.3%F.S
Single-pixel precision	10μm
Liquid absorption capacity	2μL
Electrode dimensions	29*29mm

D Electrode electrolyte weight immersion system

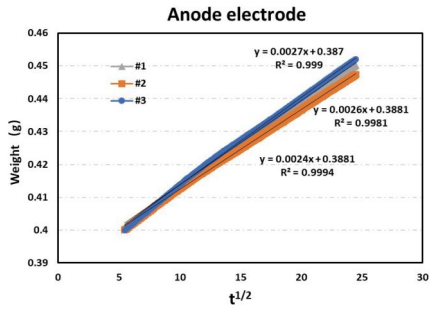
(1) sheets of lithium-ion batteries

1. Equipped with a high-precision weighing system for stable and efficient testing repeatability.
2. In-situ real-time characterization of electrolyte wetting rate on positive and negative electrode sheets of lithium-ion batteries.
3. Test Samples: Positive electrode sheets, negative electrode sheets.
4. Good overlap among the three sets of electrode sheets, indicating good consistency in electrolyte wetting.



Testing Principle

(2) Application Case



Trimming three sets of negative electrode sheets from the same batch (65*70mm)

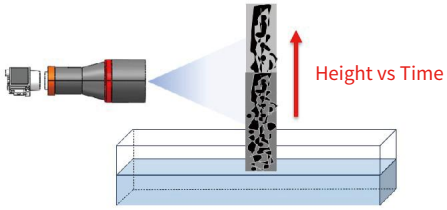
(3) Model and Parameters

ETS1100	
Balance capacity	0~220g
Balance precision	±0.1mg
Electrode size	65*70mm

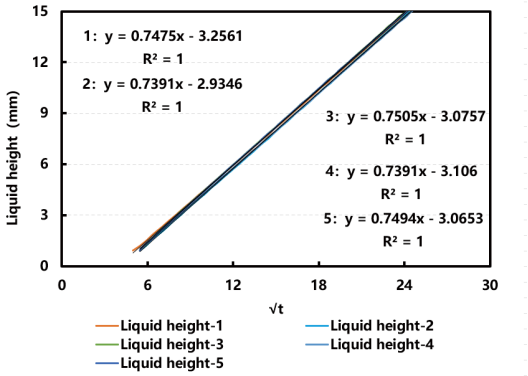
E Electrode Electrolyte Height Immersion System

(1) Key Features

1. Equipped with a high-precision vision acquisition system for stable and efficient testing repeatability.
2. In-situ real-time characterization of electrolyte wetting rate on positive and negative electrode sheets of lithium-ion batteries.
3. Test Samples: Positive electrodes, negative electrodes.
4. Capable of simultaneous testing of 3 parallel samples, exhibiting good consistency in electrolyte wetting.



Testing Principle



(2) Model and Parameters

CHT 1000	
Testing time	10min
Pixel precision	100μm
Electrode size	200*40mm

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