

-DEDICATED TO LITHIUM-ION BATTERY TESTING AND DEVELOPMENT-

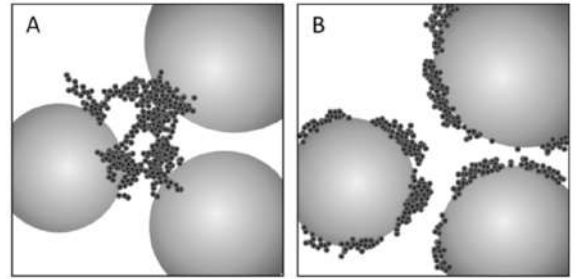
**EST**<sup>®</sup>  
元能科技

# BATTERY SLURRY RESISTIVITY



## THE SIGNIFICANCE OF SLURRY RESISTIVITY

The slurry is an important intermediate product during the production of lithium-ion batteries (LIBs). The uniformity and stability of the slurry greatly affect the consistency and electrochemical performance of the final LIBs. Currently, only the parameter of viscosity is used to monitor the slurry, which is unable to accurately evaluate the uniformity and stability of its electrical properties. However, the conductivity of slurry, associated with the slurry formulation, conductive agent type and content, binder type and content etc, has significant correlation to the electrical performance of slurry. Moreover, the slurry may gel and deposit after standing for a period of time. At this time, the conductivity value will also become inhomogeneous in the vertical direction. Therefore, the conductivity of the slurry is a useful parameter to characterize the uniformity and stability of the electrical properties of the slurry.



B.G. Westphal et al. / Journal of Energy Storage 11 (2017) 76–85

Monitoring the conductivity of the slurry, not only, it can evaluate the influence of different active materials, conductive agents, binders, solid content, etc. on the electrochemical performance of the slurry, but also it can also be used for monitoring the process stability, which can quickly identify abnormalities in the mixing process, and avoid the waste of time and cost caused by defective slurry flowing into the subsequent process.

## SLURRY RESISTIVITY TEST PRINCIPLE

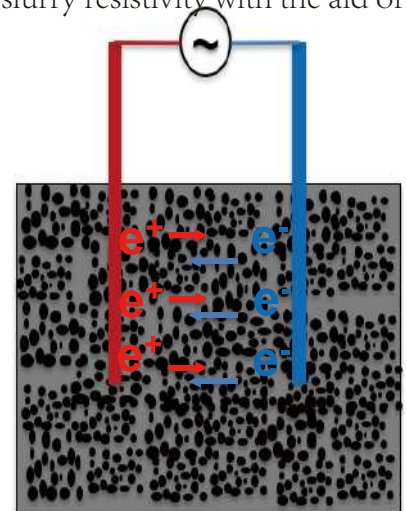
**Test steps:** Putting a certain volume of slurry (~80mL) into the measuring glass, inserting a clean electrode pen, and starting the software, then the BSR will start to test the slurry resistivity with the aid of three pairs of electrodes and save these data in the file.

**Test parameters:** Resistivity, Temperature, Time

**Calculation formula Resistivity ( $\Omega \cdot \text{cm}$ ):**  $\rho_e = \frac{U}{I} \times \frac{S}{l}$

**Character:**

1. Separate the voltage and current lines, eliminate the influence of inductance on voltage measurement, and improve the accuracy of resistivity detection;
2. The disk electrode with a diameter of 10mm ensures a relatively large contact area with the slurry and reduces the testing errors;
3. Monitoring the changes of resistivity of the slurry in real time at three positions in the vertical direction over time;



Resistivity measurement range	2.5 $\Omega \cdot \text{cm}$ ~50M $\Omega \cdot \text{cm}$
-------------------------------	--

Resistivity measurement accuracy	$\pm 0.5\%$
----------------------------------	-------------

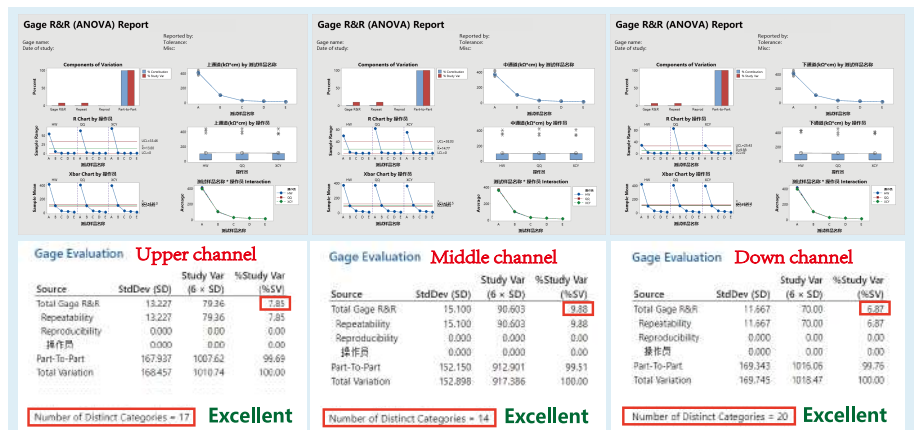
## SLURRY RESISTIVITY ANALYZER MSA

**Test program :**

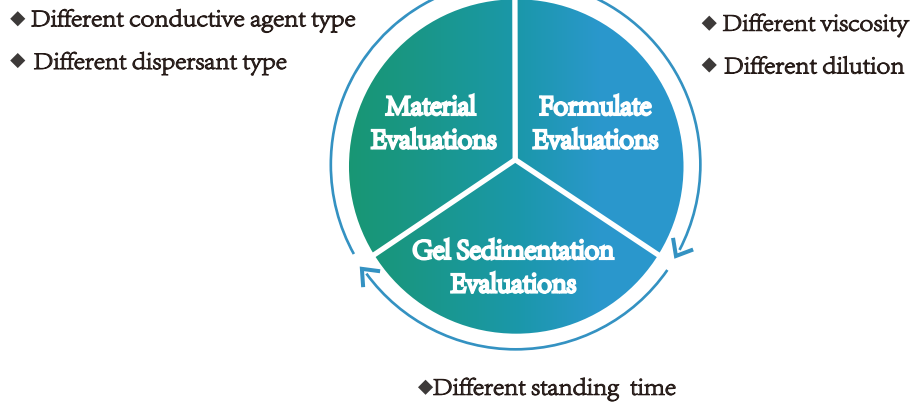
Three operators, five parallel samples, and random testing

**Test method :**

Sonicated the electrode pen with deionized water for 30 seconds, and drying it with the dust-free paper. Then five parallel samples was tested, and the fifth set of data was taken for the GRR analysis

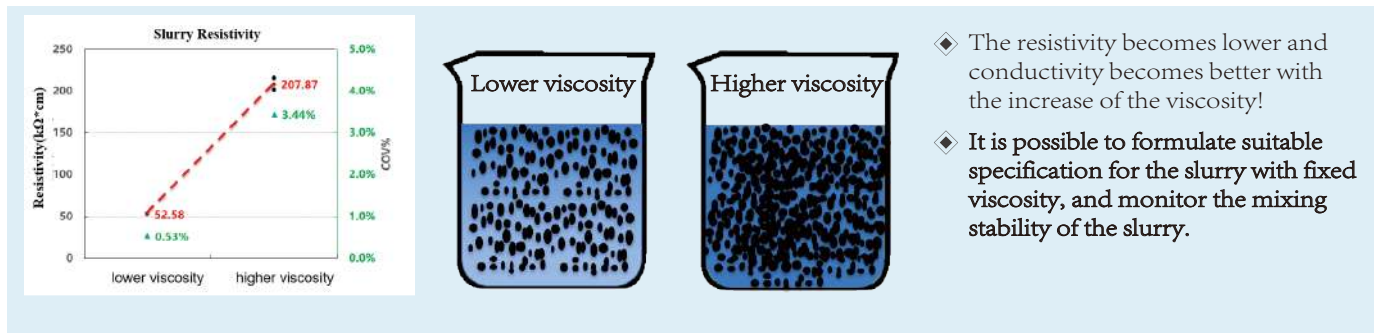


## APPLICATIONS

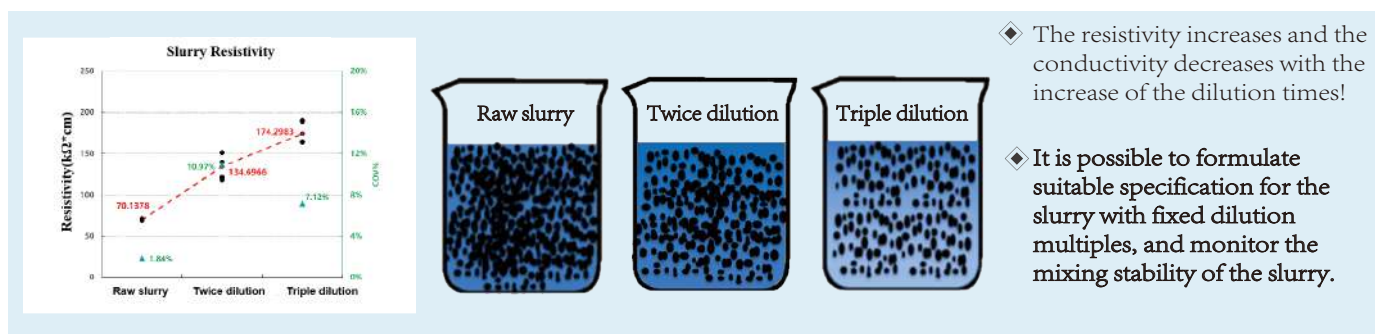


## APPLICATION CASES

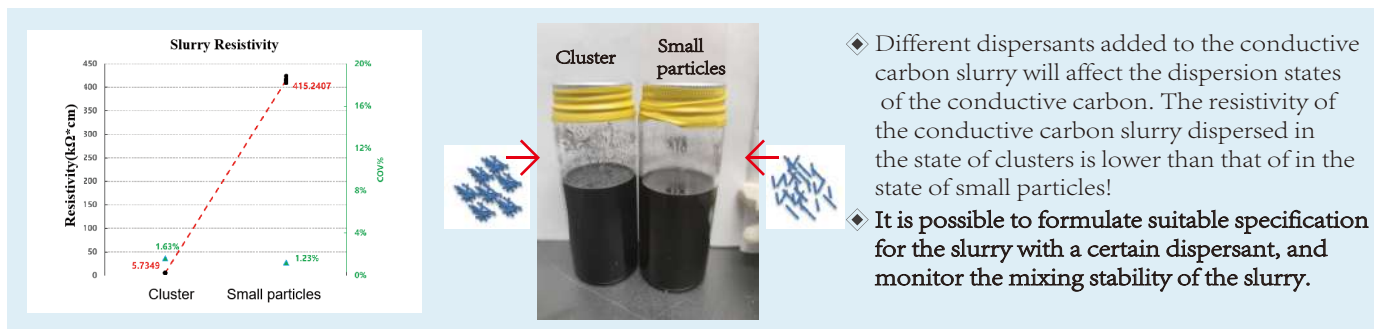
### 1. Evaluations of **different viscosity** in slurry resistivity



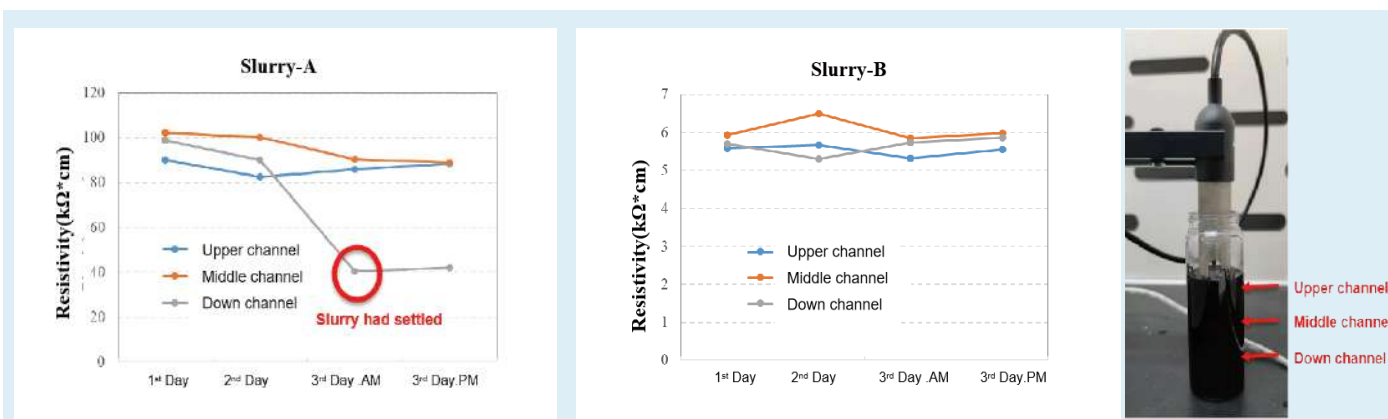
### 2. Evaluations of **different dilution** multiples in slurry resistivity



### 3. Evaluations of **different dispersant** in slurry resistivity



#### 4. Gel sedimentation evaluations: Comparing different types of conductive



- ◆ After standing for three days, the resistivity of slurry-A at down channel became significantly lower than those at middle and upper channel, indicating that the active materials in the slurry sank down into the bottom of the cup.
- ◆ After standing for three days, the resistivities of slurry-B at all three channel are almost unchanged, indicating that there was no obvious sedimentation in slurry-B;
- ◆ It is possible to formulate suitable standing time for a certain kind of slurry, and monitor the uniformity of the slurry!

#### PARAMETERS

Resistivity measurement range	2.5Ω*cm~50MΩ*cm
Resistivity measurement resolution	0.01μS/cm
Resistivity measurement accuracy	±0.5%

#### INSTALLATION REQUIREMENT

Voltage	220~240V/50~60Hz
Voltage variation tolerance	10%
Power dissipation	<80W
Environmental temperature	0~40℃
Environmental humidity	<80%RH
Net wet	5Kg
Dimension(W*D*H)	210mm*300mm*120mm (W*D*H)



ENBSR202101

INITIAL ENERGY SCIENCE & TECHNOLOGY (XIAMEN) CO.,LTD

Address: 4th Floor, No. 2, Xinfeng 2nd Road, Huli District, Xiamen City, Fujian Province, China

Tel: (86)592-5367060 Fax: (86)592-5367062

www.iestbattery.com E-mail: info@iesttech.com



IENT WeChat



IENT LinkedIn



R&D solutions  
Third Party  
Detection Service  
Special Testing  
Instruments