ELECTRODE EXPANSION TEST BENCH

M-EET BENCH FOR DILATOMETRIC ANALYSIS OF ELECTRODE MATERIAL FOR BATTERIES

MARPOSS

TECHNICAL SPECIFICATION OF **M-EET** BENCH

The M-EET Bench is an electrochemical dilatometer with advanced functionalities. It's able to measure the swelling/contraction of the electrode materials in an electrochemical cell during charge/discharge cycles ("rocking-chair").

Main features

- Contact-less transducer for measurement of volumetric variation of electrode materials
- Interchangeable set-up (whole-cell, half-cell) *(*1)*
- Easily removable sample holder from bench, for assembly/disassembly in dry-box
- Adjustable force applied to the sample (from 10 to 100 N), measured by integrated load cell
- Difference force ranges available
- Temperature compensated in the range from -10 to 60 °C, measured by integrated ambient temperature sensor
- Integrated thermocouple for permanent monitoring of the cell sample temperature during the test
- Data logging from test

Gauge type

The volumetric variation measurement of electrode material due to Reversibly intercalating ions into host materials is performed using an inductive contact-less gauge so as not to influence the natural dilation of the sample during the tests.

Gauge type	Inductive Magnetic
Measuring Range	500 μm
Resolution	0.01 μm
Maximum linearity error	0.1 μm

Other sensors on the bench

Load cell	measuring range 0-0.5 kN
	accuracy 0.25% f.s
	linearity error 0.1% f.s
Ambient Temperature Sensor	measuring range -10 - 70°C
	maximum error ± 1°C
Sample Temperature Sensor	measuring range -10 - 70° C
	maximum error ± 1°C

Configurations tests

Whole-cell under test: WE-separator-CE
Half-cell: WE (rigid separator-CE out of measuring) (*1)

The system must be used in a temperature-controlled environment in stationary conditions and with a maximum variation of 1°C/h during test.

*(*1) half-cell version available by the end of 2021*

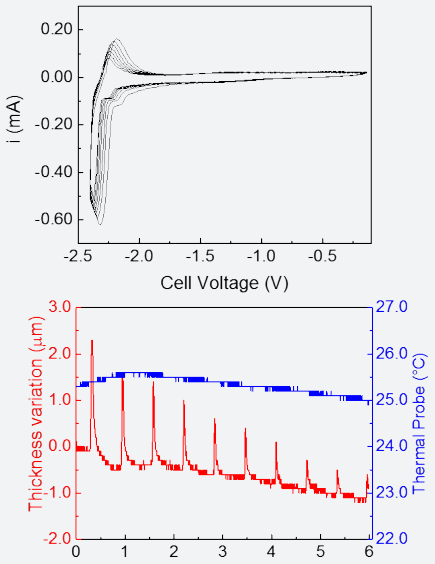
Sample characteristics

Sample diameter	ø ≤ 15 mm for WE and CE
	ø ≤20 mm for separator
Thickness	t ≤1 mm
Cell electrolyte volume	≤0.5 ml

Sample holder characteristics

Chemical compatibility: all material used for internal sample holder that compose the electrochemical chamber are chemical resistant to aqueous and non aqueous elettrolyte. Sealed sample holder (when assembled).

Study on graphite negative electrode for Lithium-ion battery



Applied force during test 10 N
Left) voltammetric cycle; Right) thickness variation and room temp. variation.