



# illumion

TRANSFORMING BATTERIES WITH **LIGHT**

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illumion



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The flagship **charge photometer**

# illumionONE

*Operando* insights into **state-of-charge** & **morphology** with **single particle resolution**



## *Operando* microscopy

See what is happening, where & when



## Lab-based tool

Fully-integrated electrochemical control in bench-top instrument



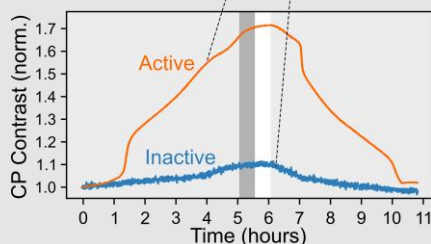
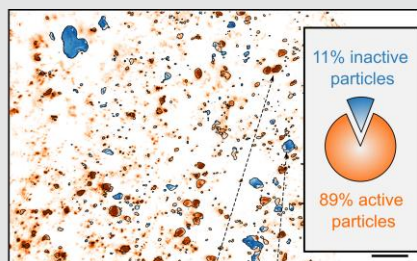
## Material agnostic

Compatible with Li-ion & beyond Li-ion chemistries



### Electrode Optimization

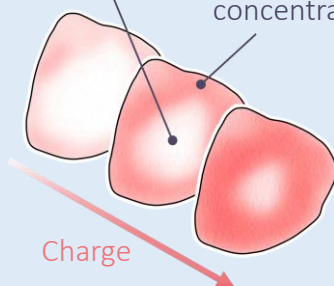
Discover how much material is active & where performance is lost.



### Fast Charging

Discover what limits charging performance on the active particle level.

No change in Li ion concentration  
Lower Li ion concentration



Developing Li ion gradients

### Material Degradation

Discover the processes leading to accelerated capacity fade & loss.



Electrically disconnected fragment

Trapped Li ions

## Charge Photometry

Images electrode during battery operation, capturing local changes to **state-of-charge & morphology** with **single particle resolution**.

Bench-top optical microscope

with fully-integrated electrochemical control

Optically-accessible coin cell

Incident light

Electrode

Li<sup>+</sup>

Li<sup>+</sup>

Reflected & scattered light

Detected charge photometry contrast

Ion (de)intercalation alters the electronic structure of the active material, changing the intensity of the scattered light detected

## illumionONE specification

Measurement	Dynamic active particle state-of-charge & morphology, with synchronised electrochemistry
Technology	Charge photometry
Cell format	Adapted coin cell
Resolvable active particle size	>350 nm
Electrode loading	Suitable for dilute & commercially-relevant loadings of active material
Image acquisition frame rate	<100 Hz
Field of view	112 x 70 $\mu$ m
Magnification	100x
Wavelength	530 nm
Product dimensions	40 x 50 x 31.5 cm (width x depth x height)



Download our  
product flyer & white paper

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