

Press Information

Growing demand for lithium-ion batteries

Ensuring quality through spectral analysis

Nänikon, November 2023 - Liquid electrolytes play a key role in the performance and lifetime of batteries.

METTLER TOLEDO's compact UV/Vis spectrophotometers allow users to evaluate the suitability of electrolyte solutions quickly, easily, and cost-effectively. Built-in reference scales provide ready-to-use results, and a color guide and webinar make it easy to get started.

The electrolyte fluid in lithium-ion batteries enables the efficient intercalation of Lithium ions between the electrodes. The quality of the electrolyte is, therefore, essential - impurities can affect the function and safety of the energy storage system.

The compact EasyPlus UV/Vis spectrophotometer from METTLER TOLEDO is a simple and cost-effective method for analyzing electrolyte solutions. The instrument measures electrolyte impurities in seconds without time-consuming sample preparation.

Built-in reference color scales in the EasyPlus spectrophotometer compare the electrolyte's measured color value with stored color reference scales to detect deviations. Or it measures the amount of UV and visible light absorbed or transmitted by the irradiated electrolyte solution, indicating the sample's purity. Either method quickly provides clarity for the customer.

Color Guide: Introduction to Color Measurement

METTLER TOLEDO's comprehensive color guide provides both a theoretical and practical introduction to the basics of color measurement with UV/Vis spectrophotometers. Spectrophotometry enables precise color analysis for the quality control and detection of sample impurities using reference scales such as APHA, Yellowness Index, and CIE-Lab. The guide also provides tips and tricks for efficient and error-free use in the laboratory. The color guide can be downloaded [here](#).

Predict battery lifetime

Users can also use UV/Vis spectrophotometry to analyze battery degradation, or the natural loss of battery performance. The starting point for degradation analysis is to establish a calibration curve for the components of a new battery - for example, by measuring the color or absorption spectrum of the electrolyte. The absorption spectrum, which changes over time as energy is degraded, can then be compared to the reference spectrum. The change value determined in this way, together with the knowledge gained from the degradation mechanisms analyzed, enables manufacturers to make predictions about the life and performance of the battery.

Instruments in different versions

The powerful spectrophotometers eliminate the need for separate colorimeters. In addition to the compact "EasyPlus" version, METTLER TOLEDO also offers an "Excellence" UV/Vis version, which saves time, space and money and also offers multiple advantages in spectrophotometry, color measurement, and water analysis. The Excellence Line spectrophotometers offer efficient accessories and can be expanded with intelligent automation tools such as a cell changer. In addition, the spectrophotometer can be integrated into a multi-parameter system to analyze not only the color and absorption spectrum but also the density and refractive index of the electrolyte, for example.

Webinar: Performing reliable color measurements

In the [webinar](#), METTLER TOLEDO demonstrates how to measure color values accurately and reliably with UV/Vis spectrophotometers. The webinar begins with the basics of color measurement with a UV/Vis instrument and explains tips and tricks for practical laboratory analysis. The user will learn to become familiar with the color scales used. The webinar also documents the analysis of an electrolyte and provides insight into working with the UV/Vis spectrophotometer.⁷



Safely and easily test the quality of electrolytes for lithium-ion batteries with compact UV/Vis spectrophotometry from METTLER TOLEDO.

About METTLER TOLEDO

METTLER TOLEDO is a leading global supplier of precision instruments and services. The Company is the world's largest manufacturer and marketer of weighing instruments for use in laboratory, industrial, and food retailing applications. METTLER TOLEDO also holds top-three market positions in several related analytical instruments and is a leading provider of automated chemistry systems used in drug and chemical compound discovery and development. In addition, the Company is the world's largest manufacturer and marketer of metal detection and other end-of-line inspection systems used in production and packaging and holds a leading position in certain process analytics applications. Additional information about METTLER TOLEDO can be found at www.mt.com.