



Level Up Your Lab

with the Autolab IMP

Metrohm
means ...
Spectroscopy!

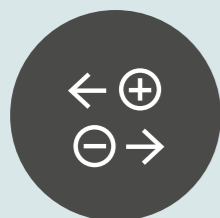


 **Metrohm**
Autolab

Level up: fundamental electrochemistry skills

The Autolab IMP allows students to start researching quickly and easily. They will develop practical skills for a wide range of professions.

The use of **potentiostats** in **published research** has **increased** by nearly **20%** in the last ten years across a spectrum of research disciplines.



Electrochemistry

- Fundamental & Applied
- Energy conversion and storage
- Materials development
- Corrosion
- Plating
- Organic synthesis
- Electroanalysis

Level up: instrumentation with superior service

The Autolab IMP meets the American Chemical Society (ACS) accreditation requirements for professional education in chemistry.

4.2 Instrumentation. Characterization and analysis of chemical systems require an appropriate suite of modern, high quality, and properly maintained instrumentation and specialized laboratory equipment that are utilized in undergraduate instruction and research.

Approved programs must have a functioning NMR spectrometer on site that undergraduates use. The field strength and capabilities of the NMR instrumentation should support the instructional and research needs of the program. If the on-site instrument does not meet all of the program's research needs, stable arrangements must be made with proximal sites to provide ready access to appropriate NMR instrumentation.

In addition, instruments from at least four of the following five categories must be on site and used by undergraduates:

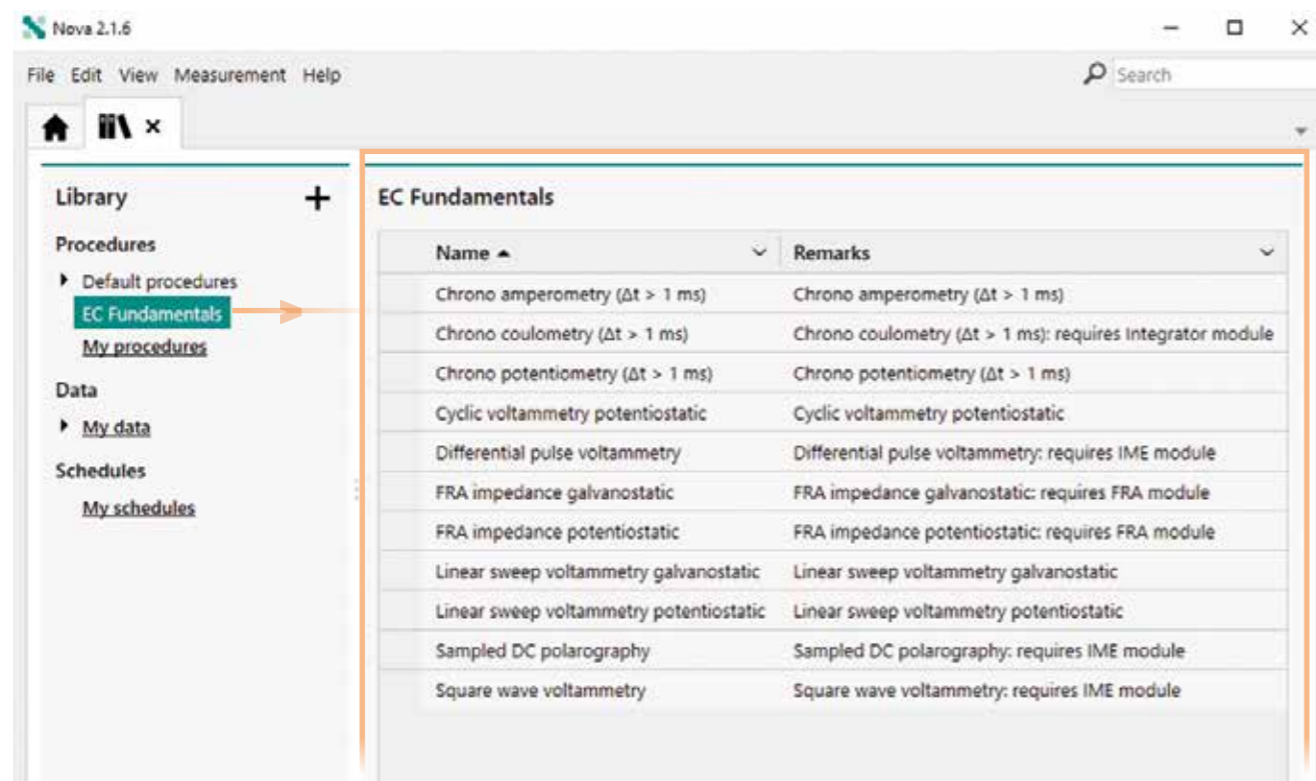
- optical molecular spectroscopy (e.g., FT-IR, fluorescence, Raman, UV-Vis)
- optical atomic spectroscopy (e.g., atomic absorption, ICP-atomic emission)
- mass spectrometry (e.g., MS, GC-MS, LC-MS)
- chromatography and separations (e.g., GC, GPC, HPLC, ion chromatography, capillary electrophoresis, SEC)
- electrochemistry (e.g., potentiometry, amperometry, coulometry, voltammetry)

Programs must maintain an additional complement of instrumentation that is adequate to support the curriculum, including undergraduate research. For example, programs might have multiple instruments from one or more of the categories listed above or additional supplemental instrumentation, such as vacuum and inert atmosphere systems (e.g., Schlenk lines), DSC, TGA, x-ray diffraction, and electron microscopy.

Metrohm's **worldwide distribution** and **service network** provide a **fast response** for service, usually within **48 hours**. Our installed instruments average 99% uptime in the first **5 years of installation**.*
Metrohm Autolab instruments undergo up to **405 quality checks** during the manufacturing process.

*Based on European markets most widely sold instruments.

NOVA software: immediate applied learning



NOVA's accessible **EC Fundamentals Library** houses **11 fundamental electrochemical procedures** for immediate use. There are nearly **60 customizable procedures** available covering all aspects of electrochemical measurements. For example:

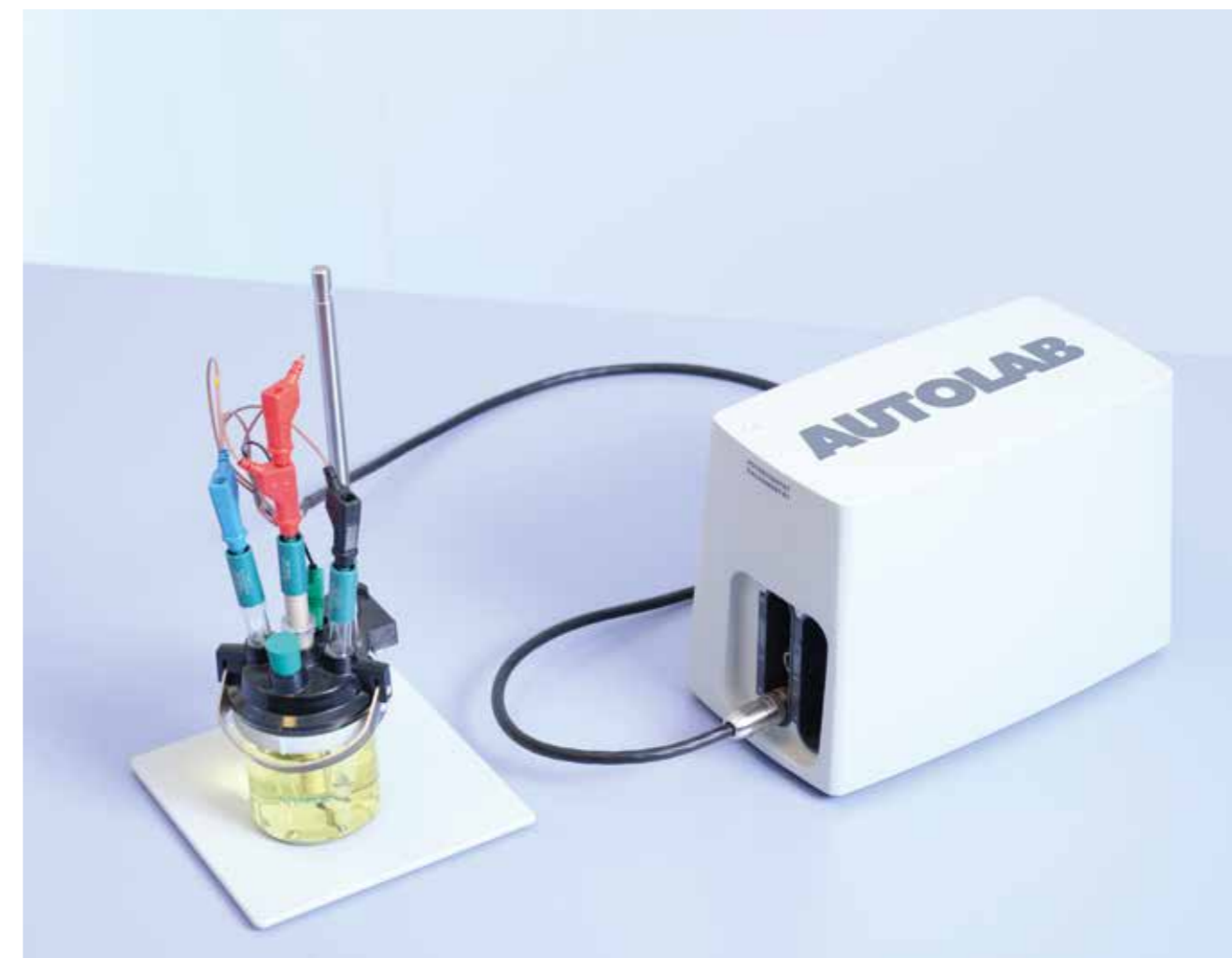
- Linear polarization to study corrosion processes with corrosion rate analysis.
- Potentiodynamic EIS for an initiation to the electrochemistry of semiconductors (Mott-Schottky plots).

NOVA conveniently provides **data acquisition** and **analysis** in one **simple-to-use** software. For example:

- Peak search, corrosion rate and hydrodynamic analysis.
- Complete fit and simulation for electrochemical impedance spectroscopy (EIS) data analysis.
- Linear and non-linear regression, baseline correction, integration, iR drop correction, and more.

Autolab IMP: professional specs for education

Explore electrochemistry from **electroanalysis** to **electrolysis** (10 nA to 100 mA, ± 10 V).
Discover **Electrochemical Impedance Spectroscopy** (EIS) with the highest measurement accuracy (>99.7 %).



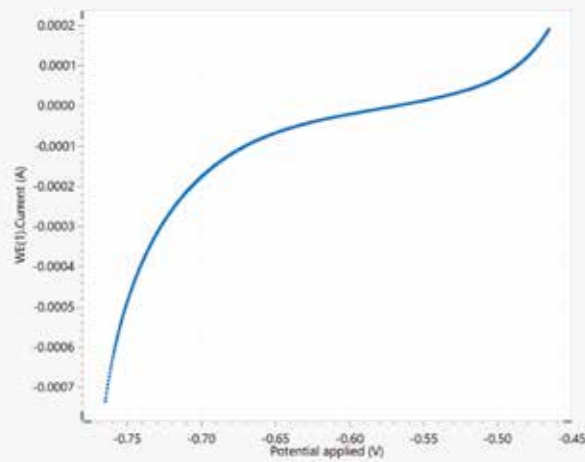
Autolab IMP specifications*

Maximum current (applied and measured)	± 100 mA
Compliance voltage	± 10 V
Voltage range (applied and measured)	± 10 V
EIS frequency range	From 10 μ Hz to 1 MHz
Analog integrator	Included

*For more specifications go to metrohm.com/electrochemistry or ask your Metrohm representative.

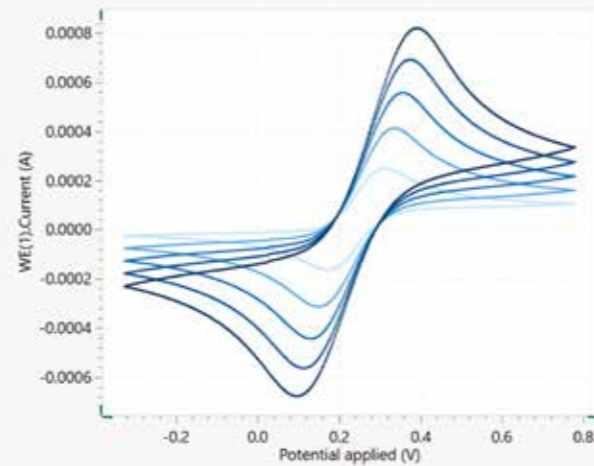
Level up: measurements & analysis

BUTLER-VOLMER



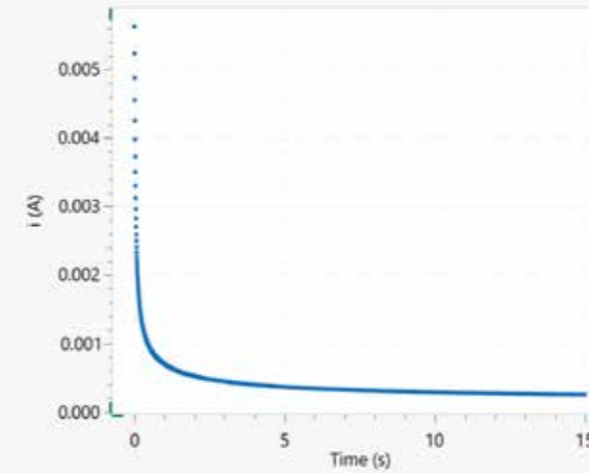
Dive into electrochemical kinetics with Polarization curves.

RANDLES-ŠEVČÍK

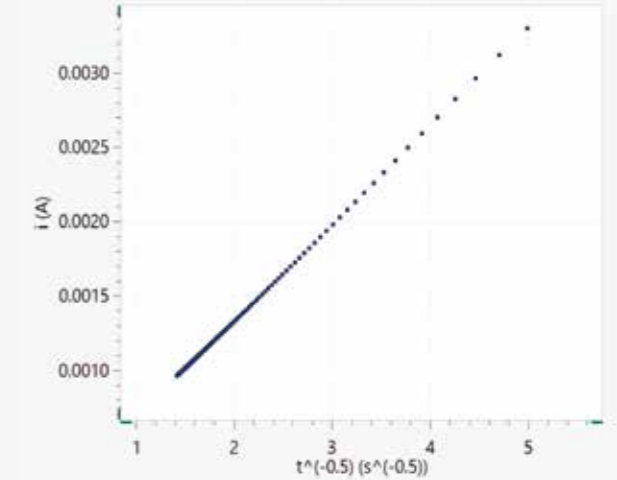


Explore the diffusion properties of redox probes with cyclic voltammetry at different scan rates.

COTTRELL EQUATION



Use chronoamperometry and Cottrell plots to understand diffusion processes.



- Get started quickly with the most common electrochemical measurements in the EC-Fundamental Library.
- Data analysis is just a click away in NOVA.

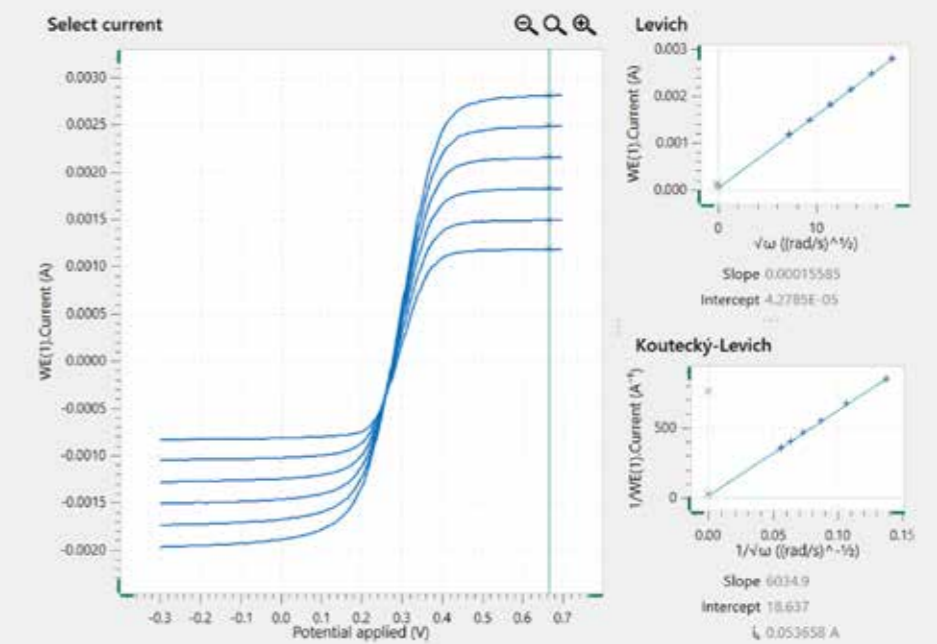
- Conveniently automate routine measurements and reduce possible errors.
- Easy and consistent workflows will keep you focused on learning

Level up: accessories & devices

Add accessories such as **rotating electrodes** for additional insights and analysis.

Run **hydrodynamic measurements** with just a few clicks.

 KOUTECKÝ-LEVICH



Advanced analysis on hydrodynamic measurement data.



Level up: EIS included

The widely popular **EIS technique is included** in the Autolab IMP which allows you to measure highly accurate data (99.7%) for next level insights.

NOVA comes with **EIS data fit and simulation** and nearly 40 predefined and customizable equivalent circuits for easy analysis.

Don't need EIS?

The Autolab PGSTAT101 is an excellent instrument if you do not require EIS. With a built-in analog integrator, ± 100 mA maximum applied and measured current (current ranges from 10 nA to 10 mA), and ± 10 V potential range.





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Dedicated to research
metrohm.com/electrochemistry