

- **Single compound conversion, activation, oxidation, reduction**
- **Direct on-line EC/MS, without chromatography**
- **All parts supplied for immediate installation and use**
- **Substantial time and cost savings**

Using Electrochemistry (EC) as a **reaction technique** before the MS allows the analyst to mimic nature's redox reactions in almost any analytical field. Many chemical and catalytic reactions (wet chemistry, Fenton, etc.) can be mimicked in a controlled manner in the electrochemical cell simply by applying a voltage potential. A large number of biochemical reactions such as enzymatic, microbial, aquatic, photolytic, etc, can be simulated without biological interferences (e.g. cell matrix, plasma, urine, soil, etc.) and the generated redox products can be easily detected by MS, making EC/MS a real **biomimetic tool** with substantial cost and time savings compared to *in-vivo* or *in-vitro* techniques.

Furthermore, (short-lived) intermediates can be generated almost instantly and their reactivity towards follow-up reactions (adduct formation with GSH or proteins, etc) can be studied individually making EC/MS a powerful technology of wide applicability in areas such as:

- Signal enhancement in MS: by oxidizing the compound(s)
- Protein chemistry (Proteomics): e.g. easy reduction of disulfide bonds, superior H/D exchange, etc.
- Mimicking drug & xenobiotic metabolism: e.g. fast and simple simulation of the cytochrome P450 metabolism.
- Superior pharmaceutical stability testing, purposeful degradation, excipients stability, etc
- Metabolite synthesis: synthesis of mg quantities of reference material for characterization by NMR or MS quantification, etc.



- Healthcare products, skin Sensitizer: testing of cosmetics on skin sensitizing effects
- Environmental degradation & persistence: mimicking and predicting the degradation and persistence of pollutants / Xenobiotics in environment
- Forensic toxicology: fast simulation and prediction of the metabolism and/or biotransformation of designer drugs, illicit drugs, etc
- Nucleic acids, DNA damage: mimicking nucleic acid oxidation and DNA damage, studying DNA adduct formation, etc
- Nutrients, flavors & fragrances: oxidative stability testing, examine the antioxidative properties and capacity, etc.

The resulting time and cost savings are substantial when compared with daunting *in-vivo* or *in-vitro* experiments. The ROXY EC system is supplied with a dual syringe infusion pump, a flow cell, Dialogue software and all connecting tubing and parts for full-covering installation.

ROXY EC for MS

Reaction cells & vessels

To cover a broad range of applications e.g., from metabolite synthesis in drug metabolism, disulfide bond reductions in protein chemistry, to on-line nano LC/EC/MS, etc., a variety of different flow cells and reaction vessels are available:

- **SynthesisCell** – bulk cell for synthesis of mg quantities
- **μ-PrepCell** – ultimate workhorse, 3 models
- **ReactorCell** – basic starter cell

General Specifications ROXY

Power	110-240 VAC, 50/60 Hz, 260 VA, autosensing
Operating modes	DC, PULSE and SCAN
Dual channel	full control of up to 2 reaction cells
Optional	4 channel Potentiostat
Potential range	between ± 4.90 V in 10 mV increments
Output	between ± 1 V or between ± 10 V (20 bit D/A converter)
RS232C	full instrument control via PC (Dialogue software)
MS trigger	via contact closure
Oven	height 37 cm; from 7°C above ambient to 45°C, accuracy 0.5°C, stability 0.1°C; accommodates 1 or 2 reaction cells (optionally 4)
Regulatory	CE, UL/CSA, RoHS compliant

DC mode

Ranges	10 pA – 20 mA in 1, 2, 5 steps
Filter (cut off)	0.5 – 0.01 Hz in 1, 2, 5 steps

PULSE mode

Range	10 nA – 20 mA in 1, 2, 5 steps
Filter (cut off)	0.5 – 0.01 Hz in 1, 2, 5 steps
Pulse times	t1: 100 – 2000 ms; t2: 0 – 2000 ms; t3: 0 – 2000 ms in 10 ms steps
Sample times	t1 - 60 ms

SCAN mode

Range	10 nA - 20 mA in 1, 2, 5 steps
Scan rate	1 - 50 mV/s in 1, 2, 5 steps
Cycle	half, full, continuous and cyclic voltammetry

Rear panel

I/O connections	Mains, Output, 2 Connectors 15 pins (A, B), manual valve (C), RS232C connector
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Physical specifications

Dimensions	44 (D) x 22 (W) x 44 (H) cm = 17.3" (D) x 8.7" (W) x 17.3" (H)
Weight	14 kg without flow cell and column

Part no	Description
210.0050A	ROXY Potentiostat with ReactorCell
210.0070A	ROXY EC system with ReactorCell
210.0074B	ROXY EC system with μ-PrepCell 2.0
210.0073A	ROXY EC system for HDX
210.0070B	ROXY EC system with ReactorCell for S-S reduction
210.0072B	ROXY EC system with μ-PrepCell 2.0 for S-S reduction



The ROXY EC System comprises the following parts:

- ROXY potentiostat DCC
- Dedicated flow cell
- Syringe pump
- Dialogue software
- Tubing assembly



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