

Identical Location SEM on a Case Example of Copper Degradation During Electrochemical CO₂ Reduction

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Identical location scanning electron microscopy (IL-SEM) enables direct visualization of material evolution by imaging the same surface region before and after various treatments.¹ In this lecture, a step-by-step approach to implementing IL-SEM, including surface marking, image alignment, and sample handling protocols, will be presented. The methodology will be demonstrated on a case study of copper catalysts undergoing degradation during electrochemical CO₂ reduction.² The observed dissolution and redeposition processes provide clear evidence of dynamic morphology restructuring, emphasizing the catalytic property changes.

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2. B. Tomc, M. Bele, M. A. Nazrulla, P. Šket, M. Finšgar, A. K. Surca, A. R. Kamšek, M. Šala, J. Š. Hudoklin, M. Huš, B. Likozar and N. Hodnik, *J. Mater. Chem. A*, **2025**, 13, 4119–4128.