Electrodeposition as a tool for micro/nano fabrication

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We shall discuss application of two major advantages of electrodeposition, namely controllability (with deposition potential) and possibility to monitor the growth (by means of current/charge measurements). We shall consider two groups of fabrication processes: (1) what electrochemists fabricate for themselves (e.g., electrocatalysts) and (2) what they can fabricate for non-electrochemical devices, first of all for physics and engineering.

In Part (1), platinum and copper systems will be mostly considered, as the representative systems for oxidative electrocatalysis and for CO_2 reduction, respectively. We shall also discuss the innovative strategies, as formulated in Review [1]. All these issues are mostly related to model catalysts, and we shall try to identify the link to the real catalysts.

In Part (2), the accents templated deposition will be accented, which allows us to fabricate highly ordered low-dimensional structures. In particular, we shall discuss some challenges in fabrication of nm-diameter wires. Another aspect will be deposition of multielement functional materials. These and other sub-topics are addressed in the recent review [2].

1. M. Bernal Lopez, J Ustarroz, Curr. Opinion in Electrochem. 27 (2021) 100688.
2. G. Tsirlina, J. Solid State Electrochem. 29 (2025) 1265–1307.