

# Electrosynthesis : an alternative to the use of chemical oxidants or reductants in reactions catalyzed by transition metals

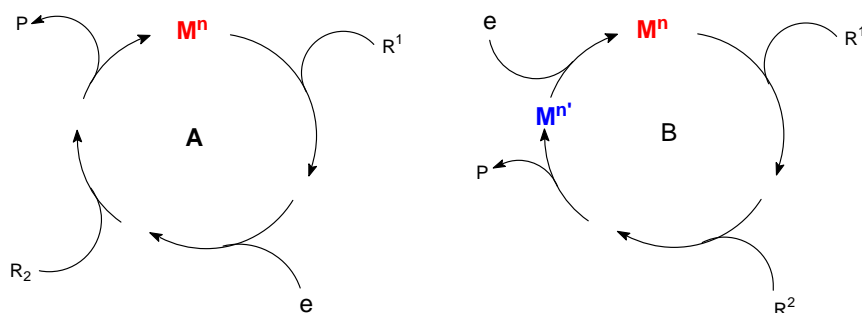
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In some transition metal-catalyzed reactions, intermediate organometallic species can be reactive only after activation by electron transfer (one or two electrons) all along the reactions (Scheme A). In such transition metal-catalyzed electrosyntheses, the electrons play the role of a reagent (oxidant or reductant) and are used in stoichiometric amount. In addition, the electrons may be used at the very beginning of the electrolyses to generate the active form of the catalyst from a non reactive precatalyst.

Some transition metal-catalyzed reactions do not require any activation of intermediate organometallic species by electron transfer, but electrons may be required to recycle the active catalyst (which initiates the catalytic cycle) from a non reactive one generated at the end of the catalytic cycle, either directly (Scheme B) or *via* a mediator. The electrons play the role of a reagent (oxidant or reductant) and are used in stoichiometric amount.

Those two aspects of transition metal-catalyzed electrosyntheses will be discussed.



A. Jutand, *Chem. Rev.* **2008**, *108*, 2300.