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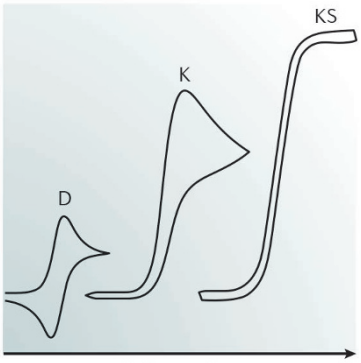
IN BRIEF

HOMOGENEOUS CATALYSIS

An electrochemical and spectroscopic look at renewable energy



Adapted from Lee, K. J. et al. (2017), Macmillan Publishers Limited

Small molecules such as water, carbon dioxide and oxygen are recognized as powerful, clean and renewable energy vectors. The energy storage or release associated with their reduction and oxidation can be efficiently achieved using homogenous transition-metal-based electrocatalysis. It is therefore important to understand, quantify and compare the modus operandi of any molecular catalysts involved in these reactions.

Electrochemical methods are commonly used to investigate redox processes. Cyclic voltammetry can provide information regarding the performance of molecular catalysts upon examination of catalytic peak current, peak shift and foot-of-the-wave analysis. Deeper chemical insight into the catalytic processes is offered through the application of complementary spectroscopic techniques, including spectroelectrochemistry, stopped-flow rapid mixing and transient absorption spectroscopy. In *Nature Reviews Chemistry*, Jillian Dempsey and co-workers use several case studies to illustrate the utility of the combination of electrochemical and spectroscopic techniques for the study of homogenous transition metal electrocatalysts.

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ORIGINAL ARTICLE Lee, K. J. et al. Electrochemical and spectroscopic methods for evaluating molecular electrocatalysts. *Nat. Rev. Chem.* **1**, 0039 (2017)