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Heterogenized molecular (pre)catalysts for water oxidation and oxygen reduction

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Propositions

accompanying the thesis:

Heterogenized molecular (pre)catalysts for water oxidation and oxygen reduction

1. Activation of Ir-based pyridyl-triazolylidene catalysts is dependent more on steric than electronic factors.
Chapter 2 of this thesis
2. The starting potential and scan direction should be chosen carefully when using molecular systems in water to prevent unwanted redox processes to take place.
Chapter 3 of this thesis
3. Having a complex with a reversible redox couple does not imply it is also a good dioxygen reduction catalyst.
Chapter 4 of this thesis
4. The immobilization of the ligand on the electrode surface can be a good strategy to form the desired complex where there are fast ligand exchange kinetics.
Chapter 5 of this thesis
5. The structure of adsorbed molecular complexes cannot be determined by voltammetric data only.
Lei and Anson, *Inorg. Chem.* **1994**, 33, 5003-5009.
6. One cannot expect to form a heterogenized molecular catalyst by simply mixing Vulcan®, a ligand and a copper salt.
Gewirth *et al*, *Angew. Chem. Int. Edit.* **2009**, 48, 165-167
7. The absence of papers discussing the formation of active copper oxide layers on the electrode surface during homogeneous electro-oxidation of water is disturbing.
Mayer *et al*, *Nat. Chem* **2012**, 4, 498-502
8. Although both abide by the same physical and chemical laws and rules, a homogeneous and a heterogeneous chemist think fundamentally different about catalytic processes.
9. The "final" experiment before finalizing a manuscript is always the most dreaded.
10. If you need to practise your signature, go work in an ISO 17025 accredited lab.