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

Ham, C.J.M. van der

Propositions

accompanying the thesis:

Hetrogenized 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.