Structural and functional models for [NiFe] hydrogenase

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Stellingen

(Propositions)

behorende bij het proefschrift

Structural and Functional Models for [NiFe] Hydrogenase

door

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1. Different codes indicating the same redox states of the [NiFe] hydrogenase that are used by different groups may be unclear for a beginner of this particular field of chemistry. The efforts made to clarify this issue in recent reports are highly useful.

   J. C. Fontecilla-Camps, A. Volbeda, C. Cavazza and Y. Nicolet, *Chem. Rev*., 2007, **107**, 4273-4303.
   W. Lubitz, E. Reijerse and M. van Gastel, *Chem. Rev*., 2007, **107**, 4331-4365.

2. Good functional models of an enzyme do not have to resemble the active site.

   S. Canaguier, V. Artero and M. Fontecave, *Dalton Trans.*, 2008, 315-325.
   X. Hu, B. S. Brunschwig and J. C. Peters, *J. Am. Chem. Soc.*, 2007, **129**, 8988-8998.
   I. Hatay, B. Su, F. Li, R. Partovi-Nia, H. Vrubel, X. Hu, M. Ersoz and H.H. Girault *Angew. Chem.-Int. Edit.*, 2009, 48(28), 5139-5142.
   B. Keita, G. J. Zhang, A. Dolbecq, P. Mialane, F. Secheresse, F. Miserque and L. Nadjo, *J. Phys. Chem. C*, 2007, **111**, 8145-8148.

3. It's a pity that the most beautiful structural models of [NiFe] hydrogenases have been synthesized at the temperature ranging between –40 ºC and 0 ºC.

   S. Tanino, Z. Li, Y. Ohki and K. Tatsumi, *Inorg. Chem*., 2009, **48**, 2358-2360.
   Y. Ohki, K. Yasumura, K. Kuge, S. Tanino, M. Ando, Z. Li and K. Tatsumi, *Proc. Natl. Acad. Sci. U. S. A*., 2008, **105**, 7652-7657.

4. The number of reports published each year on the adverse effects of the increasing concentrations of carbon dioxide in the atmosphere is much larger than the number of reports with possible remedies.

5. Biomimetics of enzymes is equally exciting as the complex molecular constructions of the metalloenzymes and the mechanisms they follow to do their catalytic work.

   (Chapter 1 of this thesis)

6. By substituting different groups on the backbone of the ligands, the stability and electrocatalytic properties of the resulting coordination complexes can be tuned.

   This thesis.

7. Keeping an open eye for serendipitious results and trying to find the mysteries behind them is exciting.

   This thesis (Chapter 6, 7, 8 and Appendix 1)

8. Regardless of the mechanism followed by the enzyme hydrogenase, different model complexes follow different mechanisms in proton reduction.

   This thesis

9. [NiRu] complexes are much more stable than the corresponding [NiFe] complexes in the presence of protic acids.

   This thesis (Chapter 5)

10. Any good work resulting in a nice publication is backed by many lessons learned from numerous failures.
11. The foundation of every nation is the education of its youth.
12. Regions, Religions and Reactions are all meant to assist the living creatures in the planet in one or another way.
13. Teaching is the greatest job especially in the underdeveloped countries. The illiterate parents give the future of their kids and thereby the future of the family, the society and the country in the hands of teachers.

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