

Electrocatalytic water oxidation influenced by the ratio between Cu^{2+} and a multiply branched peptide ligand.

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Rok wydania

2019

Czasopismo

Catalysis Communications

Numer woluminu

122

Strony

5-9

DOI

10.1016/j.catcom.2019.01.004

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

A multiply branched peptide, H-Gly-Dap(H-Gly)-Dap(H-Gly-Dap(H-Gly))-Gly-NH₂ (Dap= L-2,3-diaminopropionic acid) has been designed to furnish multi- Cu^{2+} centers exhibiting electrocatalytic activity in water oxidation. Each branching moiety serves as binding pocket for one cupric ion. UV-vis, CD and EPR spectroscopy suggest $\{\text{NH}_2, \text{N}^-, \text{N}^-, \text{NH}_2\}_{\text{eq}}$ set for the first two coordinated Cu^{2+} ions, whereas a different mode for the third that in turn changes the electrochemical behavior of the complex. This third Cu^{2+} triggers water oxidation at lower ($\sim 60\text{mV}$) overpotential, increased catalytic current and 4 times as high O_2 evolution rate compared to the 2:1 metal-to-ligand stoichiometry.

Słowa kluczowe

Copper, Water oxidation, Peptide, Branched peptide

Adres publiczny

<http://dx.doi.org/10.1016/j.catcom.2019.01.004>

Strona internetowa wydawcy

<http://www.elsevier.com>

Plik został wygenerowany dnia 2026-10-09 09:04:15

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/Z4Vs36e>.