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RESEARCH INTERESTS

- Coordination and organometallic chemistry  
- Catalysis  
- Surface chemistry  
- Bioinspired CO₂ reduction catalysts  
- Cluster synthesis

SUMMARY

Despite being the most prevalent greenhouse agent, carbon dioxide has become increasingly recognized as a potentially valuable resource. Its large scale conversion into useful chemicals has the potential to provide cheap and renewable alternatives to fossil fuels. However, the obstacle to this large scale implementation is the development of effective catalysts for CO₂ reduction. To overcome this hurdle, the synthetic chemist can draw a unique inspiration from redox enzymes that catalyze this reaction in nature. For this purpose, we target catalysts based on heteropolymetallic clusters that can activate CO₂ and allow its selective reduction to more chemically valuable products. We focus in particular on the development of catalytic systems combining electron reservoirs with active sites for CO₂ activation. These assemblies will either be directly used as catalysts in solution or will be integrated to electro and photocatalytic devices by covalent grafting on conducting or semi-conducting surfaces.

PUBLICATIONS

2016

Low Temperature Activation of Supported Metathesis Catalysts by Organosilicon Reducing Agents  
G. Siddiqui, V. Mougel, C. Copéret
Highly Active Subnanometer Au Particles Supported on TiO2 for Photocatalytic Hydrogen Evolution from a Well-Defined Organogold Precursor, [Au5(mesityl)5].

Atomistic Description of Reaction Intermediates in Supported Metathesis Catalysts Enabled by DNP SENS.

M. Pucino, V. Mougel, R. Schowner, A. Fedorov, M. R. Buchmeiser, C. Copéret
Unprecedented Activity and Stability of Supported Metathesis Catalysts byCombining N-Heterocyclic Carbene and Surface Siloxy Ligands on Cationic W Oxo Sites.

Surface Organometallic and Coordination Chemistry towards Single-Site Heterogeneous Catalysts: Strategies, Methods, Structures, and Activities

F. Allouche, V. Mougel, W. Gruening, C. Copéret
Synthesis and reactivity of a pentacoordinated thiolate-based imido alkylidene W(VI) complexes

M. Valla, D. Stadler, V. Mougel, C. Copéret
Switching On Metathesis Activity of Re-Oxo-Alkylidene Surface Sites Through a Tailor-Made Silica-Alumina Support

V. Mougel, C. Copéret
Isostructural Molecular and Surface Mimics of the Active Sites of the Industrial WO3/SiO2 Metathesis Catalysts
ACS Catal., 2015, 5, 6436–6439

G. Siddiqui, V. Mougel, C. Copéret
[Au5Mes5]: Improved gram-scale synthesis and its use as a convenient precursor for halide-free supported gold nanoparticles

C. Camp, L. Chatelain, V. Mougel, J. Pécaut, M. Mazzanti.
Ferrocene-Based Tetradeutate Schiff Bases as Supporting Ligands in Uranium Chemistry

Quantitatively Analyzing Metathesis Catalyst Activity and Structural Features in Silica-Supported Tungsten Imido–Alkylidene Complexes

V. Mougel, M. Pucino, C. Copéret.
Strongly σ Donating Thiophenoxide in Silica-Supported Tungsten Oxo Catalysts for Improved 1-Alkene Metathesis Efficiency
Organometallics, 2015, 34, 551-554.

F. Allouche, V. Mougel, C. Copéret.
Activating thiolate-Based Imido Alkylidene W(VI) Metathesis Catalysts by grafting on silica

A Bulky Aryloxide Ligand Stabilizes a Heterogeneous Metathesis Catalyst.


V. Mougel, C. Copéret

Magnitude and consequence of OR ligand σ-donation on alkene metathesis activity in d⁰ silica-supported (=SiO)W(NAr)(CHtBu)(OR) catalysts.


2013


A Well-Defined Silica-Supported Tungsten Oxo Alkylidene Is a Highly Active Alkene Metathesis Catalyst.


Carretta, G. Amoretti, P. Santini, V. Mougel, M. Mazzanti, S. Gambarelli, E. Colineau, R. Caciuffo.

Magnetic properties and chiral states of a trimetallic uranium complex.


A Uranium-Based UO₂⁺⁺⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻⁻ Mn²⁺ Single-Chain Magnet Assembled trough Cation-Cation Interactions.


C. Camp, V. Mougel, J. Pécaut, L. Maron, M. Mazzanti.

Cation-Mediated Conversion of the State of Charge in Uranium Arene Inverted-Sandwich Complexes.


2012

V. Mougel, C. Camp, J. Pécaut, C. Kefaidis, L. Maron, C. Copéret, M. Mazzanti.

Siloxides as Supporting Ligands in Uranium(III)-Mediated Small-Molecule Activation.


V. Mougel, L. Chatelain, J. Pecaut, R. Caciuffo, E. Colineau, J-C Griveau, M. Mazzanti.

Uranium and manganese assembled in a wheel-shaped nanoscale single-molecule magnet with high spin-reversal barrier.


R. Copping, V. Mougel, C. Den Auwer, C. Berthon, P. Moisy, M. Mazzanti.

A tetrameric neptunyl(V) cluster supported by a Schiff base ligand.


L. Chatelain, V. Mougel, J. Pecaut, M. Mazzanti.

Magnetic communication and reactivity of a stable homometallic cation-cation trimer of pentavalent uranyl.


V. Mougel, J. Pécaut, M. Mazzanti.

New polynuclear U(IV)–U(V) complexes from U(IV) mediated uranyl(V) disproportionation.


2011

R. Copping, V. Mougel, S. Petit, P. Moisy, M. Mazzanti.

A versatile precursor for non-aqueous neptunyl(V) chemistry.

B. Biswas, V. Mougel, J. Pécaut, M. Mazzanti.
Base-Driven Assembly of Large Uranium Oxo/Hydroxo Clusters.

2010

- C. Camp, V. Mougel, P. Horeglad, J. Pécaut, M. Mazzanti.
  Multielectron Redox Reactions Involving C-C Coupling and Cleavage in Uranium Schiff Base Complexes.
- V. Mougel, P. Horeglad, G. Nocton, J. Pécaut, M. Mazzanti.
  Cation-Cation Complexes of Pentavalent Uranyl: From Disproportionation Intermediates to Stable Clusters.
- V. Mougel, B. Biswas, J. Pécaut, M. Mazzanti.
  New insights into the acid mediated disproportionation of pentavalent uranyl.

2009

- V. Mougel, P. Horeglad, G. Nocton, J. Pécaut, M. Mazzanti.
  Stable Pentavalent Uranyl Species and Selective Assembly of a Polymetallic Mixed-Valent Uranyl Complex by Cation-Cation Interactions.

PATENTS

  Activation of olefin metathesis catalysts by organic reductants
  Publication date: 23 June 2016.
  Immobilized metathesis tungsten oxo alkylidene catalysts and use thereof in olefin metathesis
  Use of immobilized molybdenum and tungsten containing catalysts in olefin cross-metathesis
  Immobilized tungsten catalysts and use thereof in olefin metathesis