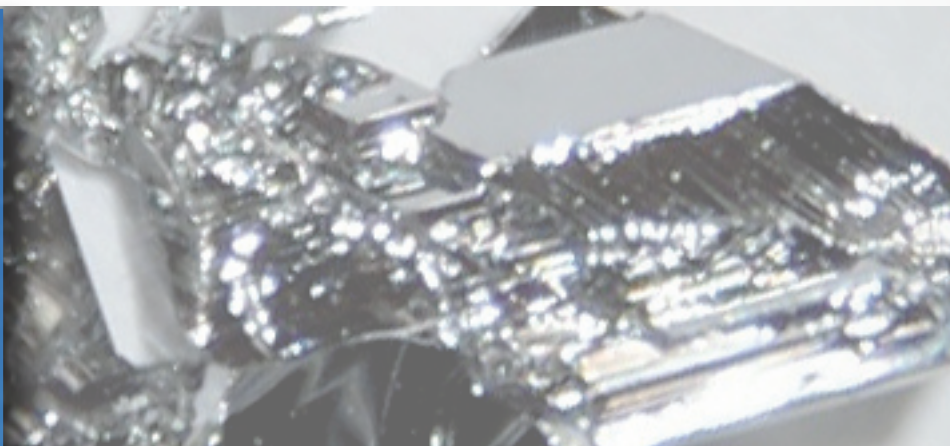


Ruthenium and Osmium Cluster Complexes Derived from N-Heterocyclic Silylenes, Germylenes and Stannylenes



PROJECT DETAILS

Funding Programme:
7th Framework Programme
(FP7)

Sub-Programme:
People

Funding Scheme:
European Re-integration
Grants (ERG)

Project Reference:
268329;
UE-10-POLYRUO-268329

Project Duration:
36 Months (from 2010-09-01
to 2013-08-31)

Total Project Value:
€ 45.000

EU Grant-Aid:
€ 45.000

Funding to UniOvi:
€ 45.000

Website:
http://cordis.europa.eu/project/rcn/96132_en.html

PROJECT DESCRIPTION

The purpose of this project is to extend the chemistry of ruthenium and osmium clusters derived from N-heterocyclic carbenes (NHC) to the silicon, germanium and tin analogues (NHM, M = Si, Ge, Sn). The interest of this proposal is based on: (a) the absence of this kind of polymetallic compounds, (b) the interesting Ru₃-NHC and Os₃-NHC chemistry reported recently by Cabeza, Whittlesey, Cooke and Cole, amongst others, which cannot be replicated by mononuclear derivatives, and (c) the fact that Ru-NHC complexes are among the most active catalysts for key reactions in organic syntheses; for example olefin metathesis (including ring opening and closing processes) and a battery of cross-coupling reactions (Heck, Suzuki, Sonogashira, Stille and Kumada). The project will be divided in two main parts: (A) Stoichiometric reactions, including studies on: (i) the synthesis and characterisation of new Ru-NHM and Os-NHM cluster complexes, (ii) the ability of NHM ligands to promote intramolecular C H, C C, C N, Si N, Ge N and Sn N bond activations, (iii) the reactivity of the aforementioned derivatives toward unsaturated organic substrates, aiming C C, C N and M heteroatom coupling reactions to form novel functionalised organic molecules, and (iv) theoretical calculations (DFT) to rationalize the transformations observed; and (B) Catalytic processes (olefin metathesis and coupling reactions) using the complexes outlined in part A or modified systems containing hemilabile ligands, able to promote the necessary coordination vacancies onto which the organic substrates can be fixed and transformed. This work will be developed in Cabeza/s Organometallic Cluster group (University of Oviedo-Spain), which its great experience in the area of ruthenium and osmium carbonyl clusters (derived from N-donor and NHC ligands), along with the promising possibilities that the fusion of NHM ligands and polymetallic compounds offer, provides all the necessary ingredients for a successful project.

UNIOVI TEAM

Javier Ángel Cabeza de Marco ,
jac@uniovi.es

Pablo García Álvarez ,
pablofabero@hotmail.com

, Department of Organic and Inorganic
Chemistry

PROJECT PARTNERS

Project Coordinator
Universidad de Oviedo, Spain