

**Development of Innovative Transformations by Using Synergistic
Effect of Plural Metals**

Yoshiaki Nishibayashi

(The University of Tokyo, School of Engineering, Associate Professor)

【Outline of survey】

We have long been interested in development of homogeneous catalysis of polynuclear transition metal complexes since direct and indirect cooperation of plural transition metals can be expected for the activation of substrates to provide novel transformations that are not attainable at conventional monometallic centers. Toward this end, our study has been focused on development of innovative transformations by using synergistic effect of plural metals. We will explore the following subjects during the term of this research project: (1) development of novel catalytic nitrogen fixation systems under the mild reaction conditions, (2) development of novel and efficient catalytic reactions of organic compounds.

【Expected results】

Our study on development of innovative transformations by using synergistic effect of plural metals through this research project will open up new aspects of coordination chemistry, organometallic chemistry, organic chemistry, and their related chemistry. We believe that the results will make significant contribution to the future of human beings as new technology created in Japan.

【References】

- A Non-metal System for Nitrogen Fixation, Y. Nishibayashi, M. Saito, S. Uemura, S. Takekuma, H. Takekuma, Z. Yoshida, *Nature*, 428, 279-280 (2004).
- Bimetallic System for Nitrogen Fixation: Ruthenium-assisted Protonation of Coordinated N₂ on Tungsten with H₂, Y. Nishibayashi, S. Iwai, M. Hidai, *Science*, 279, 540-542 (1998).

【Term of project】 FY2007 - 2011

【Budget allocation】 9,400,000 yen
(2007 direct cost)

【Homepage address】 <http://park.ite.u-tokyo.ac.jp/nishiba/>