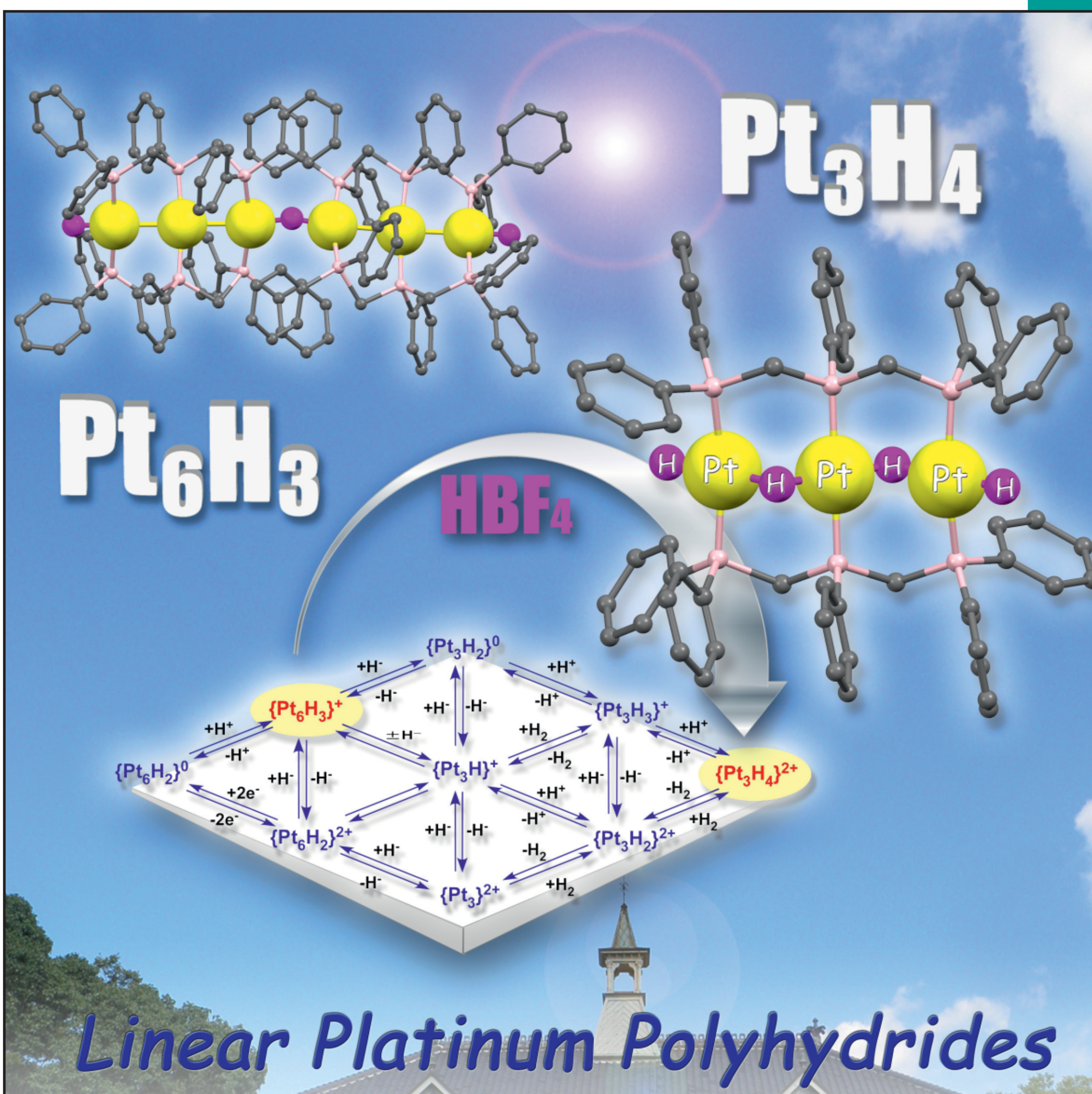
EurJIC

European Journal of Inorganic Chemistry

A Journal of ChemPubSoc Europe

11/2017

www.eurjic.org



Front Cover

Tomoaki Tanase et al.

Linear Triplatinum Tetrahydride Complex Supported by Triphosphine Ligands, $[Pt_3(\mu\text{-}H)_2(H)_2(\mu\text{-dpmp})_2](BF_4)_2$ {dpmp = bis(diphenylphosphinomethyl)phenylphosphine}

WILEY-VCH

DOI: 10.1002/ejic.201700205

Read the full text of the article at 10.1002/ejic.201601505

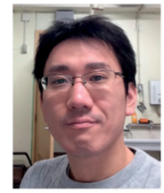
Linear Triplatinum Tetrahydride Complex Supported by Triphosphine Ligands, $[Pt_3(\mu\text{-}H)_2(H)_2(\mu\text{-dpmp})_2](BF_4)_2$ {dpmp = bis(diphenylphosphinomethyl)phenylphosphine}


Tomoaki Tanase

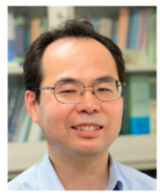

Kana Yamamoto


Rika Hatano


Kanako Nakamae


Bunsho Kure


Yasuyuki Ura


Takayuki Nakajima

Coordination PROGRAMMING

Japan Society for the Promotion of Science 日本学術振興会

科研費 KAKENHI

国立大学法人 奈良女子大学 Nara Women's University

Invited for the cover of this issue is the group of Tomoaki Tanase at Nara Women's University, Japan. The cover image shows the transformation of linear trihydride hexaplatinum complex Pt_6H_3 to a novel linear triplatinum tetrahydride (Pt_3H_4) by treatment with HBF_4.

In one word, how would you describe your research?

Long history! For more than 20 years, we have tried to explore linearly extended metallic molecular wires by utilizing linear polyphosphines, which could be useful building blocks for nanostructured molecular devices.

What prompted you to investigate this topic?

Hydride-bridged Pt_3HPt_3 chains were reported by our group in 2004, and we recently synthesized the trihydride hexaplatinum complex HPt_3HPt_3H. This complex is a promising building block for further extended metal atom chains, as the terminal hydrides can connect linear Pt_3 units, and hence, the reactivity with hydrogen species, H^+, H_2, and H^-, is very important. Therefore, the reaction of the Pt_6H_3 chain with HBF_4 was investigated.

What is the most significant result of this study?

The triplatinum unit $\{Pt_3(\mu\text{-dpmp})_2\}^{2+}$ (Pt_3^{II}) acts as a four-electron reservoir to afford linear complex Pt_3H_4 (Pt_3^{VI}) through protonation. Pt_3^{VI} could be a useful building block for linearly extended molecular metallic wires connected by hydride bridges.

What is the next challenge?

To connect the Pt_3 units by using hydride glue as well as deprotonation and dehydrogenation redox processes. It is also fascinating to explore chemically modified electrodes for electrochemical hydrogenation.

What other topics are you working on at the moment?

By using linearly designed tetraphosphines, *meso/rac*-$Ph_2PCH_2PPh(CH_2)_nP(Ph)CH_2PPh_2$ (n = 1–4), we have synthesized a variety of structurally constrained transition metal clusters and investigated their structures, properties, and reactivity. Our ongoing projects involve (1) linear Pd_8 rods from self-alignment of Pd_4 units, (2) strongly luminous Au_4 chains and $\{Au_2AgCu\}_2$ rings, (3) multinuclear Cu–hydride complexes and their reactions with CO_2, and (4) reversible O_2 binding to Rh_2 and Ir_2 complexes.

Who designed the cover?

The cover was designed by Tomoaki Tanase. It shows the reaction of Pt_6H_3 to Pt_3H_4 on the basis of possible transformation routes on a backdrop of blue sky over the memorial lecture hall at Nara Women's University.

Acknowledgment

We thank for financial support from the Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT), Japan Society for the Promotion of Science (JSPS), and Nara Women's University (NWU). We are also grateful to Prof. Kohtaro Osakada of Tokyo Institute of Technology for his help with spectral and analytical measurements. The theoretical computations were performed at the Research Center for Computational Science, Okazaki, Japan.