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**List of Publications from the Research  
Institute for Catalysis (1980)**

In 1980, the following papers by the members of the Research Institute for Catalysis, Hokkaido University, were Published.\*)

**I. Ordinary Articles**

- Standard Molal Real Free Energies of Solvation of Monoatomic Ions and Absolute Electrode Potentials in Fused Salts  
R. Notoya and A. Matsuda  
J. Res. Inst. Catalysis, **28**, 1 (1980).
- Standard Real Free Energies of Ionization of Single Atoms and Ions in Aqueous Media  
A. Matsuda, R. Notoya and H. Hiratsuka  
J. Res. Inst. Catalysis, **28**, 79 (1980).
- Absolute Electromotive Forces of Single Electrodes  
A. Matsuda, R. Notoya and H. Hiratsuka  
J. Res. Inst. Catalysis, **28**, 269 (1980).
- The Overpotential Components on the Palladium Hydrogen Electrode  
M. Enyo and T. Maoka  
J. Electroanal. Chem., **108**, 277 (1980).
- On the Explanation of Cells in High School Science Course  
T. Yokoyama and M. Enyo  
Kagaku-kyoiku (Chemical Education), **28**, 298 (1980) (in Japanese).
- Electrooxidation of Methanol on a Platinum-Tin Oxide Catalyst  
A. Katayama  
J. Phys. Chem., **84**, 376 (1980).
- Barbiturates at the Mercury/Solution Interface an Ellipsometric Study  
K. Kunimatsu and R. Parsons  
J. Electroanal. Chem., **100**, 335 (1979).
- Infra Red Spectroscopy of the Electrode-Electrolyte Interphase  
A. Bewick and K. Kunimatsu  
Surface Science, **101**, 131 (1980).
- Hydrogen Exchange, Isomerization, Hydrogenation and Metathesis of Olefin on Solid Surfaces— Unsaturated Coordination Model of Active Sites  
K. Miyahara  
J. Res. Inst. Catalysis, **28**, 279 (1980).

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\*) A similar list for 1979 appeared in Vol. 28, No. 1 (1980) of this Journal.

*List of Publications*

- Varieties of MgO Catalysts for 1, 3-Butadiene Hydrogenation  
K. Miyahara, Y. Murata, I. Toyoshima, Y. Tanaka and T. Yokoyama  
Tech. Rep. of ISSP, Series A-1083 (1980).
- Olefin Metathesis Reaction over Supported Molybdenum Oxide Catalysts  
Ka. Tanaka, K. Miyahara and Ke. Tanaka  
Preprint No. B47 of the 7th Intern. Congr. Catal., Tokyo, 1980.
- Mechanism of Methane Formation by Catalytic Hydrogenation of Carbon  
Ke. Tanaka, T. Okuhara, K. Miyahara and K. Aomura  
Nippon Kagakukai-shi, Chem. Soc. Japan **1980**, 945 (in Japanese).
- The Promoting Effects of Various Alkali Metal Carbonates on the Reduction of Carbon Dioxide with Carbon  
S. Yokoyama, K. Miyahara, Ke. Tanaka, J. Tashiro and I. Takakuwa  
Nippon Kagakukai-shi, Chem. Soc. Japan **1980**, 974 (in Japanese).
- Reduction of Carbon by Carbon Dioxide Catalyzed by Alkali Metal Carbonates  
S. Yokoyama, K. Miyahara, Ke. Tanaka, I. Toyoshima, J. Tashiro and K. Takakuwa  
Shokubai (Catalyst), **22**, 1 (1980) (in Japanese).
- Stereoselectivity of Olefin Metathesis Reaction over Supported Molybdenum Oxide Catalysts  
Ka. Tanaka, M. Itoh, K. Miyahara and Ke. Tanaka  
Shokubai (Catalyst), **22**, 274 (1980) (in Japanese).
- Spectroscopic Characterization of Alumina Supported Transition Metal Carbonyl Catalysts. 1. Mo(CO)<sub>6</sub>  
A. Kazusaka and R. F. Howe  
J. Mol. Catalysis, **9**, 183 (1980).
- Spectroscopic Characterization of Alumina Supported Transition Metal Carbonyl Catalysts. 2. W(CO)<sub>6</sub> and Cr(CO)<sub>6</sub>  
A. Kazusaka and R. F. Howe  
J. Mol. Catalysis, **9**, 199 (1980).
- Interaction of Nitric Oxide with Supported Chromium, Molybdenum and Tungsten Catalysts  
A. Kazusaka and R. F. Howe  
J. Catalysis, **63**, 447 (1980).
- Spins Trapping of Molecules Adsorbed on Zinc Oxide  
T. Matsuzaki, T. Uda, A. Kazusaka, G. W. Keulks and R. F. Howe  
J. Am. Chem. Soc., **102**, 7511 (1980).

*List of Publications*

- Tracer Studies of the Reaction Paths of the CO Oxidation over Polycrystalline Palladium and Rhodium  
T. Matsushima  
J. Catalysis, **64**, 38 (1980).
- Tracer Studies of the Reaction Paths and Kinetics of CO Oxidation over Platinum, Palladium, Iridium and Rhodium  
T. Matsushima  
Proceeding of the 7th International Congress on Catalysis, Tokyo, 1980.
- Base-catalysed Deuterium Exchange Reactions of 6, 6-Dimethyl-2-methylenebicyclo [3. 1. 1] heptane [Pin-2(10)-ene] and 6, 6-Dimethylbicyclo [3. 1. 1] heptan-2-one (Nopinone)  
R. Ohnishi  
J. Chem. Soc. Perkin Trans. II, 530 (1980).
- Photocatalytic Production of Hydrogen from Water and Texas Lignite by Use of Platinized Titania Catalyst  
S. Sato and J. M. White  
Ind. Eng. Chem. Prod. Res. Dev., **19**, 542 (1980).
- Photoassisted Water-gas Shift Reaction over Platized TiO<sub>2</sub> Catalysts  
S. Sato and J. M. White  
J. Am. Chem. Soc., **102**, 7206 (1980).
- Magnetic Resonance Studies of Hydrogen Adsorbed on Zinc Oxide. 1. ESR of Conduction Electrons in the Accumulation Layer of Zinc Oxide  
M. Watanabe  
Japan. J. Appl. Phys., **19**, 1853 (1980).
- Magnetic Resonance Studies of Hydrogen Adsorbed on Zinc Oxide. II. Proton NMR of Chemisorbed Hydrogen and Molecular Hydrogen Adsorbed Ionically  
M. Watanabe and T. Ito  
Japan. J. Appl. Phys., **19**, 1863 (1980).
- Charge-transferred States of H<sub>2</sub> and CO on ZnO  
M. Watanabe and T. Ito  
Proc. 8th Internl. Vacuum Congress and 4th Internl. Conf. on Solid Surfaces, Cannes, 440 (1980).
- NMR Study of the Interaction between Xenon and Zeolites A, X and Y  
T. Ito and J. P. Fraissard  
Proc. Vth Internl. Conf. on Zeolites, Napoli, p. 510, 1980.
- XPS and AES Studies of Adsorption of CH<sub>3</sub>OH on W and Re  
J. Kubota, K. Yoshida, K. Azuma, K. Miyahara and I. Toyoshima  
Shokubai (Catalyst), **22**, 319 (1980) (in Japanese).

*List of Publications*

- Study of CH<sub>3</sub>OH Adsorbed on W and Re by XPS and AES  
J. Kubota, K. Yoshida, K. Azuma, K. Miyahara and I. Toyoshima  
Shokubai (Catalyst), **22**, 319 (1980) (in Japanese).
- Field-emission Microscopic Study of Catalytic Decomposition of Methanol on Metal Surfaces Part 1. Tungsten  
J. Kubota and K. Azuma  
J. Chem. Soc. Faraday I, **76**, 558 (1980).
- Adsorption of NH<sub>3</sub> on Iron Single Crystal Surfaces; (110) (111) and Stepped (111) Surfaces  
K. Yoshida  
J. Res. Inst. Catalysis, **28**, 15 (1980).
- Field Emission Microscopic Study of the Adsorption of Sulfin and its Compounds on Molybdenum  
K. Ishizuka  
27th International Field Emission Symposium, Tokyo, p. 123, 1980.
- The Effect of Sulfin on the Adsorption of H<sub>2</sub>, CO, N<sub>2</sub> and C<sub>2</sub>H<sub>4</sub> on Molybdenum: Flash Desorption Combined with FEM  
T. Kikuchi and K. Ishizuka  
27th International Field Emission Symposium, Tokyo, p. 128, 1980.
- Scattering of Rare Gas Atoms from the (111) Plane of Silver  
H. Asada  
Japan. J. Appl. Phys., **19**, 2055 (1980).
- On the Coverage Dependence of the Surface Diffusion Constant  
H. Asada and M. Masuda  
Surface Sci., **99**, L429 (1980).
- Dividing Surface in Transition State Theory of Reaction Rates: Note on Horiuti's Paper, "On the Statistical Mechanical Treatment of the Absolute Rate of Chemical Reaction"  
T. Nakamura  
J. Res. Inst. Catalysis, **28**, 293 (1980).
- Systematic Preparation of New Contracted Gaussian-type Orbital Sets II. Test Basis Sets for Cu<sub>2</sub> Molecule with and without Splitting of the Outer Orbitals  
H. Tatewaki and S. Huzinaga  
J. Chem. Phys., **72**, 399 (1980).
- A Systematic Preparation of New Contracted Gaussian-Type Orbital Sets III. Second Row Atoms from Li through Ne  
H. Tatewaki and S. Huzinaga  
J. Comp. Chem., **1**, 205 (1980).

*List of Publications*

Compact Contracted Gaussian-type Basis Sets from Li to Ne  
H. Tatewaki and S. Huzinaga  
Int. J. Quantum Chem., **S. 14**, 93 (1980).

Compact Contracted Gaussian-type Basis Sets from Na to Ar  
Y. Sakai, H. Tatewaki and S. Huzinaga  
Int. J. Quantum Chem., **S. 14**, 107 (1980).

**II. Letters and Communications**

Reactions of Water with Carbon and Ethylene over Illuminated Pt/TiO<sub>2</sub>  
S. Sato and J. M. White  
Chem. Phys. Lett., **70**, 131 (1980).

Photodecomposition of Water over Pt/TiO<sub>2</sub> Catalysts  
S. Sato and J. M. White  
Chem. Phys. Lett., **72**, 83 (1980).

X-ray Photoelectron Spectroscopic Study of the Surface of Carbon Doped with Potassium Carbonate  
S. Yokoyama, Ka. Tanaka, I. Toyoshima, K. Miyahara, K. Yoshida and J. Tashiro  
Chem. Letters, Chem. Soc. Japan **1980**, 599.

On the Reversibility of Metal Carbene Formation Process in Olefin Metathesis Reaction over MoO<sub>3</sub>/β-TiO<sub>2</sub> Catalyst  
Ka. Tanaka, K. Miyahara and Ke. Tanaka  
Chem. Letters, Chem. Soc. Japan **1980**, 623.

Stereoselectivity in the Metathesis Reaction of But-2-ene on a β-Titanium Oxide-supported Molybdenum Oxide  
Ka. Tanaka, Ke. Tanaka and K. Miyahara  
Chem. Commun., J. Chem. Soc. **1980**, 666.

**III. Notes**

Infra Red Spectroscopy of the Electrode-Electrolyte Interphase  
A. Bewick, K. Kunimatsu and B. S. Pons  
Electrochim. Acta, **25**, 465 (1980).

Surface Characterization by Underpotential Deposition: Leed on Gold Surfaces  
A. Hamelin, A. Katayama, G. Picq and P. Vennereau  
J. Electroanal. Chem., **113**, 293 (1980).

Adsorption of CO on a Stepped Fe(111) Surface  
K. Yoshida  
J. Res. Inst. Catalysis, **28**, 105 (1980).

*List of Publications*

Standard Molal Real Free Energies of Solvation of Individual Ions and Electromotive Forces of Single Electrodes in Non-Aqueous Solutions (Addendum)

A. Matsuda and R. Notoya

J. Res. Inst. Catalysis, **28**, 67 (1980).

**IV. Review**

Conceptions and Developments in the Rate Theory of Chemical Reactions

K. Miyahara

Kagaku Kyoiku (Chemical Education), Chem. Soc. Japan, **28**, 342 (1980) (in Japanese).