

LIST OF PUBLICATIONS

2002

SECTION OF CATALYTIC SURFACE CHEMISTRY

Laboratory of Active Surface Structure and Properties

[ORIGINAL PAPERS]

- 1 . Yasufuku, H., Ohminami, Y., Tsutsumi, T., Asakura, K., Kato, M., Sakai, Y., Kitajima, Y., Iwasawa, Y. : "Observation of energy-filtered image for X-ray photoemission electron microscopy (EXPEEM) using a retarding Wien-filter energy analyzer", *Chem. Lett.*, 842-843 (2002) *
- 2 . Chun, W.-J., Asakura, K., Ishii, H., Liu, T., Iwasawa, Y. : "The effect of ppm-level Na impurity on the structure of SiO₂-supported Mo catalysts prepared in a clean room", *Topics in Catal.*, **20** : 89-95 (2002) *
- 3 . Notoya, Y., Hayakawa, K., Fujikawa, T., Kubota, T., Shido, T., Asakura, K., Iwasawa, Y. : "Multiple scattering approach to the Pt L₂-edge XANES of CO adsorption on small Pt particles", *Chem. Phys. Lett.*, **357** : 365-370 (2002) *
- 4 . Shido, T., Yamaguchi, A., Inada, Y., Asakura, K., Nomura, M., Iwasawa, Y. : "Dispersive XAFS study on Cu and Mo species in zeolites during the catalyst preparation", *Topics in Catal.*, **18** : 53-58 (2002) *
- 5 . Ijima, K., Ohminami, Y., Suzuki, S., Asakura, K. : "Polarization-dependent EXAFS measurements of an α -Molybdenum trioxide single crystal", *Topics Catal.*, **18** : 125-127 (2002) *
- 6 . Mulukutla, R.S., Shido, T., Asakura, K., Kogure, T., Iwasawa, Y. : "Characterization of rhodium oxide nanoparticles in MCM-41 and their catalytic performances for NO-CO reactions in excess O₂", *Appl. Catal. A*- **228** : 305-314 (2002) *
- 7 . Yamaguchi, A., Suzuki, A., Shido, T., Inada, Y., Asakura, K., Nomura, M., Iwasawa, Y. : "In situ time-resolved energy-dispersive X-ray absorption fine structure study on the decarbonylation processes of Mo(CO)₆ entrapped in NaY and HY zeolites", *J. Phys. Chem. B* **106** : 2415-2422 (2002) *
- 8 . Bian, C. R., Suzuki, S., Asakura, K., Hei, L. and Tushima, N. : "EXAFS studies on the structure of the PVP-Stabilized Cu/Pd particles colloiddally dispersed in solution", *J. Phys. Chem., B* **106** : 8587-8598 (2002) *
- 9 . K. Asakura, S. Sato, K. Irokawa and H. Kuroda, "Surface reaction induced by FEL-IR", *Jpn.J.Appl.Phys.*, 41-1, 118-119(2002)*

[Review]

- 1 . 朝倉清高、岩澤康裕 : 「偏光全反射蛍光 XAFS を用いた金属-酸化物基板界面構造の研究」 表面科学、23,332-338(2002)*
- 2 . 田 旺帝 朝倉清高 : 「XAFS シリ-ズ(15)In-situ 偏光全反射蛍光 XAFS(in-situ PTRF-XAFS)法」 放射光 **15**,363-366(2002)*

[BOOKS]

- 1 . Asakura, K., Thomas, J.M. Edit. : "Symposium on Frontiers in XAFS Spectroscopy: Application to Catalysis and Interface Science", *Topics Catal.*, **18** : 1-1 (2002)
- 2 . 朝倉清高 : 「XAFS の解析」、 in X線吸収分光法 太田俊明編 p55-82 (2002)
- 3 . 朝倉清高 : 「全反射 XAFS」、 in X線吸収分光法 太田俊明編 p106-110 (2002)

Laboratory of Surface Reaction Dynamics

[ORIGINAL PAPERS]

- 1 . Horino, H., Rzeznicka, I., Kokalj, A., Kopal, I., Hiratsuka, A., Ohno, Y. and Matsushima, T. : "Two-directional N₂ desorption in thermal dissociation of N₂O on Rh(110), Ir(110) and Pd(110) at low temperatures", *J. Vac. Sci. Technol.*, **A20** : 1592-1596 (2002) *
- 2 . Rzeznicka, I., Morales, L. de la Garza, Matsushima, T. : "Surface phase transitions of Pt(110) studied by desorption dynamics of product CO₂ in steady-state CO oxidation", *J. Vac. Sci. Technol.*, **A20** : 1475-1480 (2002) *
- 3 . Kokalj, A., Kopal, I., Horino, H., Ohno, Y., Matsushima, T. : "Orientation of N₂O molecule on Pd(110)

surface”, *Surface Science*, **506** : 196-202 (2002) *

- 4 . Horino, H., Liu, S., Sano, M., Wako, S., Hiratsuka, A., Ohno, Y., Kobal, I., Matsushima, T. : “Ad-molecule orientation and thermal- and photo-induced surface-aligned desorption”, *Topics in Catalysis*, **18** : 21-26 (2002) *
- 5 . Yamanaka, T. and Ino, S. : “Atomic depth distribution and growth modes of Sn on Si(111)-4×1-In and $\alpha\text{-}\sqrt{3}\times\sqrt{3}$ -Au surfaces at room temperature”, *J. Cryst. Growth.*, **246** : 9-14 (2002) *
- 6 . Yamanaka, T., Hellman, A., Gao, SW., and Ho, W. : “State-resolved femtosecond two-pulse correlation measurements in NO photodesorption from Pt(111)”, *Surf. Sci.*, **514** : 404-408 (2002) *
- 7 . Yamanaka, T. and Ino, S. : “Atomic depth distribution and effects of surfactants in growth of Ag and Au on Si(111)- $\sqrt{3}\times\sqrt{3}$ -Ga (1ML), 4×1-In and $2\sqrt{3}\times 2\sqrt{3}$ -Sn surfaces at room temperature”, *Phys. Rev.*, **B 66** : 085316-1--085316-7 (2002) *
- 8 . Yamanaka, T. and Ino, S. : “Surfactant-mediated growth of an ordered flat film of an intrinsic liquid metal on a semiconductor surface: Ga on Si(111)-4×1-In”, *Phys. Rev.*, **B 66** : 153309-1—153309-4 (2002) *
- 9 . Yamanaka, T. and Ino, S. : “Transition from overlayer growth to alloying growth of Ga on Si(111)- $\alpha\text{-}\sqrt{3}\times\sqrt{3}$ -Au”, *Phys. Rev. Lett.*, **89** : 196101-1--196101-4 (2002) *

[REVIEWS]

- 1 . Matsushima, T. : “Decomposition of nitrogen oxides on noble metals and angle-resolved measurements of desorbing products”, *Catalysis Surveys from Japan*, **5** : 71-80 (2002) *
- 2 . Kobal, I., Rzeznicka, I., Matsushima, T. : “Site identification and angle-resolved measurements of desorbing surface reaction products under steady-state conditions”, *Recent Research Developments in Physical Chemistry, Transworld Research Network* **6**:391-424(2002) *
- 3 . Yamanaka, T. and Ino, S. : “Surface electron channeling and structure analysis of Si surfaces”, *Trends in Chemical Physics* **10**:1-29 (2002) *

[BOOK]

- 1 . Yamanaka, T., Shimomura, N. and Ino, S. : “Ultra-high vacuum scanning electron microscopy combined with total reflection angle x-ray spectroscopy”, *Proc. 3rd International Symposium on Atomic Level Characterizations for New Materials and Devices '01*, : 303-305 (2002)

Laboratory of Interfacial Spectrochemistry

[ORIGINAL PAPERS]

- 1 . Miki, A., Ye, S. and Osawa, M. : “Surface-enhanced IR absorption on platinum nanoparticles: an application to real-time monitoring of electrocatalytic reactions”, *Chem. Commun.*, (14) : 1500-1501 (2002)*
- 2 . Miyake, H., Ye, S. and Osawa, M. : “Electroless deposition of gold thin films on silicon for surface-enhanced infrared spectroelectrochemistry”, *Electrochem. Commun.*, **4** (12): 973-977 (2002)*
- 3 . Quayum, ME., Ye, S. and Uosaki, K. : “Mechanism for nucleation and growth of electrochemical palladium deposition on an Au(111) electrode”, *J. Electroanal. Chem.*, **520** (1-2) : 126-132 (2002)*
- 4 . Morita, S., Tsunomori, F. and Ushiki, H., “Polymer Chain Conformation in the Phase Separation Process of a Binary Liquid Mixture”, *Euro. Polym. J.*, **38** : 1863-1870 (2002)*
- 5 . Wei, Z.-D. Miki, A., Ohmori, T. and Osawa, M., “Methanol electrooxidation on upd-Sn modified electrodes”, *Acta Phys.-Chim. Sin.*, **18** : 1120-1124 (2002)*

[BOOKS]

- 1 . Osawa, M. : “Surface Enhanced Infrared Absorption Spectroscopy”, in *Handbook of Vibrational Spectroscopy*, Vol. 1, J. M. Chalmers and P. R. Griffiths (Eds.), John Wiley & Sons, Chichester, p. 785-799 (2002)
- 2 . Ye, S. and Uosaki, K. : “Atomically Controlled Electrochemical Deposition and Dissolution of Noble Metals” in *Encyclopedia of Electrochemistry* (ed. Bard, A. J.), Vol. 1, (eds. Gileadi, E.; Urbakh, M.), Wiley-VCH, Weinheim, (2002), p. 471-512 (2002)..
- 3 . 大澤雅俊 : 「赤外・ラマン分光」、『電気化学測定マニュアル 実践編 (電気化学会編)』丸善 (東京)、51-57 (2002)

SECTION OF CATALYST FUNCTION DESIGN

Laboratory of Catalytic Reaction Chemistry

[ORIGINAL PAPERS]

- 1 . Di Paola, A., Garcia-Lopez, E., Ikeda, S., Marci, G., Ohtani, B. and Palmisano, L. : "Photocatalytic Degradation of Organic Compounds in Aqueous Systems by Transition Metal Doped Polycrystalline TiO₂", *Catal. Today*, **75**: 87-93 (2002) *
- 2 . Torimoto, T., Si, S. and Ohtani, B. : "Quartz Crystal Microbalance Study on Photoelectrochemical Deposition of Lead(IV) Oxide on Nanocrystalline Titanium(IV) Oxide Nanoparticulate Films", *Electrochemistry*, **70**: 438-441 (2002) *
- 3 . Ikeda, S., Abe, C., Torimoto, T. and Ohtani, B. : "Visible Light-induced Hydrogen Evolution from Aqueous Suspensions of Titanium(IV) Oxide Modified with Binaphthol", *Electrochemistry*, **70**: 442-445 (2002) *
- 4 . Nakanishi, T., Yamakawa, N., Asahi, T., Osaka, T., Ohtani, B. and Uosaki, K. : "Enantioselective Adsorption of Phenylalanine onto Self-Assembled Monolayer of 1,1'-Binaphthalene-2,2'-dithiol on Gold", *J. Am. Chem. Soc.*, **124**: 740-741 (2002) *
- 5 . Yagi, I., Tsunozaki, K., Fujishima, A., Ohtani, B. and Uosaki, K. : "The effects of nitrogen and plasma power on electrochemical properties of boron-doped diamond electrodes grown by MPCVD", *J. Electrochem. Soc.*, **149**: E1-E5 (2002) *
- 6 . Kominami, H., Murakami, S.-y., Kato, J.-i., Kera, Y. and Ohtani, B. : "Correlation of Physical Properties of Titanium(IV) Oxide Particles with Their Activities of Photocatalytic Reactions in Aqueous Suspensions", *J. Phys. Chem. B*, **106**:10501-10507 (2002) *
- 7 . Di Paola, A., Marci, G., Palmisano, L., Schiavello, M., Uosaki, K., Ikeda, S. and Ohtani, B. : "Preparation, Characterization and Photocatalytic Activity of Polycrystalline TiO₂ Doped with Various Transition Metal Ions", *J. Phys. Chem. B*, **106**: 637-645 (2002) *
- 8 . Torimoto, T., Nakamura, N., Ikeda, S. and Ohtani, B. : "Discrimination of Active Crystalline Phase in Anatase-Rutile Mixed Titanium(IV) Oxide Photocatalysts through Action Spectrum Analyses", *Phys. Chem. Chem. Phys.*, **4**:5910-5914 (2002) *
- 9 . Torimoto, T., Reyes, J. P., Iwasaki, K., Pal, B., Shibayama, T., Sugawara, K., Takahashi, H. and Ohtani, B.: "Preparation of Novel Silica-Cadmium Sulfide Composite Nanoparticles having Adjustable Void Space by Size-Selective Photoetching", *J. Am. Chem. Soc.*, **125**: 316-317(2003)*
- 10 . Torimoto, T., Takabayashi, S., Mori, H. and Kuwabata, S.: "Photoelectrochemical Activities of Ultrathin Lead Sulfide Films Prepared by Electrochemical Atomic Layer Epitaxy", *J. Electroanal. Chem.*, **522**: 33-39 (2002)*

[REVIEWS]

- 1 . Torimoto, T. and Ohtani, B. : "Studies on Discrimination of Active Crystalline Phase for Photocatalytic Reaction through Action Spectrum Analyses", *Hikarishokubai (Photocatalysis)*, 32-37 (2002)
- 2 . Ikeda, S., Torimoto, T. and Ohtani, B. : "Preparation and Photochemical Properties of Titanium Oxide(IV) Fine Particles with Aromatic Compounds Fixed on their Surface", *Hikarishokubai (Photocatalysis)*, 48-51 (2002)
- 3 . Ohtani, B., Pal, B. and Ikeda, S. : "Photocatalytic organic syntheses: Selective cyclization of amino acids in aqueous suspensions", *Catal. Surv Asia*, **7**:165-176(2003)

[BOOKS]

- 1 . Ohtani, B. : "Catalysts Designed in Nanometer Scale", *The Front of Nanotechnology* (M. Tsukada and A. Kawazu eds: The Front of Nanotechnology, Tokyo Kyoiku Joho Center, Tokyo) 225-232 (2002) (Japanese)
- 2 . Kominami, H., Murakami, S.-y., Kera, Y. and Ohtani, B. : "Design, Preparation, and Characterization of Highly Active Metal Oxide Photocatalysts", *Photocatalysis -Science and Technology-* (M. Kaneko and I. Okura eds: Photocatalysis -Science and Technology-, Kodansha-Springer, Tokyo) 29-49 (2002)
- 3 . Ohtani, B. and Ohno, T. : "Photocatalytic Organic Syntheses by Using Semiconductor Particles", *Photocatalysis -Science and Technology-* (M. Kaneko and I. Okura eds: Photocatalysis -Science and Technology-, Kodansha-Springer, Tokyo) 185-201 (2002)

Laboratory of Advanced Catalyst Design

[ORIGINAL PAPERS]

- 1 . Fukuoka, A., Higashimoto, N., Sakamoto, Y., Inagaki, S., Fukushima, Y. and Ichikawa, M. : "Preparation, XAFS Characterization, and Catalysis of Platinum Nanowires and Nanoparticles in Mesoporous Silica FSM-16", *Topics in Catalysis*, **18 (1-2)** : 73-78 (2002) *
- 2 . Fukuoka, A., Araki, H., Sakamoto, Y., Sugimoto, N., Tsukada, H., Kumai, Y., Akimoto, Y. and Ichikawa, M. : "Template Synthesis of Nanoparticle-Arrays of Gold and Platinum in Mesoporous Silica Films", *Nano Lett.*, **2 (7)** : 793-795 (2002) *
- 3 . Suzuki, N., Yu, J., Shioda, N., Asami, H., Nakamura, T., Huhn, T., Fukuoka, A., Ichikawa, M., Saburi, M. and Wakatsuki, Y. : "Preparation of isospecific metallocene catalysts for olefin polymerization that are covalently tethered on solid surface", *Appl. Catal. A*, **224** : 63-75 (2002) *
- 4 . Kariya, N., Fukuoka, A., and Ichikawa, M. : "Efficient evolution of hydrogen from liquid cycloalkanes over Pt and Pt-containing bimetallic catalysts supported on active carbons under "dry-wet multiphase conditions"", *Appl. Catal. A*, **233 (1-2)** : 91-102 (2002) *
- 5 . Dhepe, P. L., Fukuoka, A. and Ichikawa, M. : "Catalyst preparation using supercritical carbon dioxide: preparation of Rh/FSM-16 catalysts and their catalytic performances in butane hydrogenolysis reaction", *Catal. Lett.*, **81 (1-2)** : 69-75 (2002) *
- 6 . Shu, Y., Ohnishi, R. and Ichikawa, M. : "Pressurized Dehydrocondensation of Methane toward Benzene and Naphthalene on Mo/HZSM-5 Catalyst: Optimization of Reaction Parameters and Promotion by CO₂ Addition", *J. Catal.*, **206** : 134-142 (2002) *
- 7 . Shu, Y., Ohnishi, R. and Ichikawa, M. : "A Highly Selective and Coking-Resistant Catalyst for Methane Dehydrocondensation", *Chem. Lett.*, **3** : 418-419 (2002) *
- 8 . Shu, Y., Ohnishi, R. and Ichikawa, M. : "Stable and selective dehydrocondensation of methane towards benzene on modified Mo/HMCM-22 catalyst by the dealumination treatment", *Catal. Lett.*, **81 (1-2)** : 9-17 (2002) *
- 9 . Umakoshi, K., Yamasaki, T., Fukuoka, A., Kawano, H., Ichikawa, M. and Onishi, M. : "C-S bond cleavage of pyridine-2-thiol: A new functionality of quadruply bridged dinuclear platinum and palladium complexes", *Inorg. Chem.*, **41 (16)** : 4093-4095 (2002) *
- 10 . Suzuki, N., Yu, J., Nakamura, T., and Fukuoka, A. : "Metallocene catalysts covalently tethered on silica surfaces", *Kobunshi Ronbunshu*, **59 (4)** : 218-223 (2002) *
- 11 . El-Bahy, Z. M., Ohnishi, R., and Ichikawa, M. : "Hydrolysis of CF₄ over alumina-based binary metal oxide catalysts", *Appl. Catal. B in press* (2002) *
- 12 . Araki, H., Fukuoka, A., Sakamoto, Y., Inagaki, S., Sugimoto, N., Fukushima, Y. and Ichikawa, M. : "Template synthesis and characterization of gold nanowires and -particles in mesoporous silica FSM-16", *J. Mol. Catal. A in press* (2002) *
- 13 . Fukuoka, A., Araki, H., Sakamoto, Y., Inagaki, S., Fukushima, Y. and Ichikawa, M. : "Palladium nanowires and nanoparticles in mesoporous silica templates", *Inorg. Chim. Acta in press* (2002) *
- 14 . Shu, Y., Ohnishi, R. and Ichikawa, M. : "Highly Improved Methane Dehydrocondensation Reaction on HMCM-22 and HZSM-5 Supported Re and Mo Catalysts", *Appl. Catal. A in press* (2002) *
- 15 . Kariya, N., Fukuoka, A., Utagawa, T., Sakuramoto, M., Goto, Y. and Ichikawa, M. : "Hydrogen supply using "liquid organic hydrides" by pulse-spray mode reactor over Pt-containing catalysts", *Appl. Catal. A* **233**:91-102 (2002) *
- 16 . Shu, Y., Ma, H., Ohnishi, R. and Ichikawa, M. : "Highly stable performance of catalytic methane dehydrocondensation towards benzene on Mo/HZSM-5 by a periodic switching treatment with H₂ and CO₂", *Chem. Comm. in press* (2002) *
- 17 . Dhepe, P. L., Fukuoka, A. and Ichikawa, M. : "Preparation of highly dispersed RhPt catalysts in mesoporous silica using supercritical carbon dioxide and their catalytic performances in butane hydrogenolysis", *Chem. Comm. in press* (2002) *

[REVIEWS]

- 1 . Ohnishi, R. and Ichikawa, M. : "Effect of CO₂/CO addition in dehydroaromatization of methane on zeolite-supported Mo and Re catalysts towards hydrogen, benzene and naphthalene", *Catal. Surv. Jpn.*, **5 (2)** : 103-110 (2002)
- 2 . 市川 勝:「水素エネルギー社会に向けての技術開発動向」、*総合電気雑誌OHM*, **89(3)**: 29-36 (2002)
- 3 . Fukuoka, A., Sakamoto, Y., Araki, H., Inagaki, S., Sugimoto, N., Fukushima, Y. and Ichikawa, M. : "Template Synthesis, Formation Mechanism and Catalysis of Metal Nanowires in Mesoporous Materials", *Stud. Surf. Sci. Catal. (Proceedings of TOCAT4)* (2002) in press
- 4 . Fukuoka, A., Sakamoto, Y., Araki, H., Sugimoto, N., Inagaki, S., Fukushima, Y. and Ichikawa, M. : "Template synthesis and catalysis of metal nanowires in mesoporous silicas", *Stud. Surf. Sci. Catal.* (2002) in press
- 5 . 市川 勝:「有機物を利用する水素貯蔵・供給インフラ技術」、*燃料電池*, **1(4)**: 19-22 (2002)
- 6 . 天然ガスなどの水素エネルギー活用で北の街作り、市川 勝、さっぽろ経済、No.512(4月号)、10-11

(2002)

7. 各種新燃料のLCA, LCCについて、市川 勝、エンジンテクノロジー、23(12): 64-67(2002)

[BOOK]

1. Fukuoka, A. and Ichikawa, M.: "Surface Characteristics - Adsorption of gases and surface catalytic activity, "Morphology-Controlled Materials -Advanced Materials Processing and Characterization-", Springer-Verlag (Waseda, Y. and Muramatsu, A. eds.) (2002) in press

Laboratory of Advanced Material Design

[ORIGINAL PAPERS]

1. Shafee, E. El. and Ueda, W.: "Crystallization and melting behavior of poly(ethylene oxide)/poly (n-butyl methacrylate) blends", *Eur. Polym. J.*, **38** (7): 1327-1335 (2002) *
2. Ueda, W., Oshihara, K., Vitry, D., Hisano, T. and Kayashima, Y.: "Hydrothermal synthesis of Mo-based oxide catalysts and selective oxidation of alkanes", *Catalysis Surveys Form Japan*, **6**(1/2): 33-44 (2002) *
3. Sadakane, M., Ostuni, A. and Pope, M.T.: "Formation of 1:1 and 2:2 complexes of Ce(III) with the heteropolytungstate anion $\alpha_2\text{-}[\text{P}_2\text{W}_{17}\text{O}_{61}]^{10-}$, and their interaction with proline. The structure of $[\text{Ce}_2(\text{P}_2\text{W}_{17}\text{O}_{61})_2(\text{H}_2\text{O})_8]^{14-}$ ", *J. Chem. Soc. Dalton*, (1): 63-67 (2002) *
4. Belai, N., Dickman, M.H., Kim, K.-C., Ostuni, A., Pope, M.T., Sadakane, M., Samonte, J.L., Sazani, G. and Wassermann, K.: "Prospects for rational assembly of composite polyoxometalates", *Polyoxometalate chemistry for nano-composite design*, Yamase, T.; Pope, M.T., eds., Kluwer Academic/Plenum Publishers, New York, NY 2002, pp 17-26.
5. Neramittagapong, A., Hoshino, S., Mori, T., Kubo, J. and Morikawa, Y.: "Novel catalytic performance of SnO_2 for the steam reforming of methanol", *Chem. Lett.*, 1078-1079 (2002) *
6. Mori, T., Hirose, K., Kikuchi, T., Kubo, J. and Morikawa, Y.: "Formation of higher hydrocarbons from chloromethanes via hydrodechlorination over Pd/ SiO_2 catalyst", *Journal of the Japan Petroleum Institute*, **45**: 256-259 (2002) *
7. Mori, T., Hoshino, S., Neramittagapong, A., Kubo, J. and Morikawa, Y.: "Novel activity of SnO_2 for methanol conversion: Formation of methane, carbon dioxide, and hydrogen", *Chem. Lett.*, 390-391 (2002) *

[REVIEW]

1. Ueda, W. and Lin, S. W.: "Metal halide oxide catalysts active for alkane selective oxidation", *Catalysis, The Royal Society of Chemistry*, Vol. 16: 198-235 (2002)

[BOOKS]

1. 上田 渉: 「酸化物担持選択酸化触媒」, 『微粒子工学大系 第 巻応用技術』, フジ・テクノシステム、433-436 (2002)
2. 上田 渉: 「触媒研究と学術雑誌 / 情報 Chemistry Letters」, 『触媒』, **44** (7): 547-548 (2002)

SECTION OF MOLECULAR CATALYSIS

Laboratory of Catalysis in Organic Synthesis

[ORIGINAL PAPERS]

1. Takahashi, T., Ishikawa, M., Huo, S.: "Reaction of a Double Bond of Zirconacyclopentadienes: Formation of 1,2,3,5-Tetrasubstituted Benzenes via The C-C Bond Cleavage", *J. Am. Chem. Soc.*, **124** (3): 388-389 (2002) *
2. Takahashi, T., Li, Y., Stepnicka, P., Kitamura, M., Liu, Y., Nakajima, K. and Kotora, M.: "Coupling Reaction of Zirconacyclopentadienes with Dihalonaphthalenes and Dihalopyridines: A New Procedure for The Preparation of Substituted Anthracenes, Quinolines, and Isoquinolines", *J. Am. Chem. Soc.*, **124** (4): 576-582 (2002) *
3. Takahashi, T., Li, Y., Ito, T., Xu, F., Nakajima, K., Liu, Y.: "Reactions of Zirconacyclopentadienes with C=O, C=N, and N=N Moieties with Electron-withdrawing Groups: Formation of Six-membered Heterocycles", *J. Am. Chem. Soc.*, **124** (7): 1144-1145 (2002) *
4. Takahashi, T., Tsai, F., Li, Y., Wang, H., Kondo, Y., Yamanaka, M., Nakajima, K. and Kotora, M.: "Selective preparation of pyridines, pyridones, and iminopyridines from two different alkynes via azazirconacycles", *J. Am. Chem. Soc.*, **124** (18): 5059-5067 (2002) *

- 5 . Liu, Y., Shen, B., Kotora, M., Nakajima, K. and Takahashi, T. : "Direct addition of Zr-C bonds of alkylzirconocenes to activated alkenes". *J. Org. Chem.*, **67** (20) : 7019-7028 (2002) *
- 6 . Liu, Y., Zhong, Z., Nakajima, K. and Takahashi, T. : "Alkynylzirconation of alkynes and application to one-pot bisalkynylation of alkynes", *J. Org. Chem.*, **67** (21) : 7451-7456 (2002) *
- 7 . Arndt, S., Trifonov, A., Spaniol, TP., Okuda, J., Kitamura, M. and Takahashi, T. : "Metalation of aromatic heterocycles by yttrium alkyl complexes that contain a linked amido-cyclopentadienyl ligand: synthesis, structure and Lewis base adduct formation", *J. Org. Chem.*, **67** (1-2) : 158-166 (2002) *
- 8 . Xi, Z., Li, Z., Umeda, C., Guan, H., Li, P., Kotora, M. and Takahashi, T. : "Copper(I)-catalyzed tandem inter-intramolecular cyclization reactions of zirconacycles: formation of highly substituted styrenes, vinylcyclohexadienes, and related compounds", *Tetrahedron*, **58** (6) : 1107-1117 (2002) *
- 9 . Guo, Q., Miyaji, T., Hara, R., Shen, B. and Takahashi, T. : "Group 5 and group 6 metal halides as very efficient catalysts for acylative cleavage of ethers", *Tetrahedron*, **58** (36) : 7327-7334 (2002) *
- 10 . Wang, H., Tsai, F.-Y., Nakajima, K. and Takahashi, T. : "Evidence for transmetalation of zirconacyclopentadiene to cobalt complex", *Chem. Lett.*, (6) : 578-579 (2002) *

Laboratory of Molecular Assemblies

[ORIGINAL PAPERS]

- 1 . Schaus, S. E., Brandes, B. D., Larrow, J. F., Tokunaga, M., Hansen, K. B., Gould, A. E., Furrow, M. E., Jacobsen, E. N. : "Highly Selective Hydrolytic Kinetic Resolution of Terminal Epoxides Catalyzed by Chiral (salen)Cobalt(III)-Complexes. Practical Synthesis of Enantioenriched Terminal Epoxides and 1,2-Diols", *J. Am. Chem. Soc.*, **124** : 1307-1315 (2002) *
- 2 . Obora, Y., Nakanishi, M., Tokunaga, M., Tsuji, Y. : "Palladium complex catalyzed acylation of allylic esters with acylstannanes: Complementary method to the acylation with acylsilanes", *J. Org. Chem.*, **67**(16) : 5835-5837 (2002) *
- 3 . Takenaka, K., Obora, Y., Jiang, L. H., Tsuji, Y. : "Pt(II) and Pd(II) Complexes of Bis(diphenylphosphino)calix[4]arene Tetrabenzyl Ether: Fluxional Behavior Caused by Two Motions", *Organometallics*, **21** : 1158-1166 (2002) *
- 4 . Obora, Y., Baleta, A. S., Tokunaga, M., Tsuji, Y. : "Platinum Complex Catalyzed Reaction of Tributyltin Cyanide with Alkynes", *J. Organomet. Chem.*, **660** : 173-177 (2002) *
- 5 . Suzuki, T., Tokunaga, M., Wakatsuki, Y. : "Efficient Transformation of Propargylic Alcohols to α,β -Unsaturated Aldehydes Catalyzed by Ruthenium/water under Neutral Conditions", *Tetrahedron Lett.* **42**, 7351-7533 (2002)*

[REVIEWS]

- 1 . 辻 康之、徳永 信、大洞康嗣 : 「超分子錯体触媒反応 : 最近の展開」 『有機合成化学協会誌』、**60** : 942-952 (2002)*
- 2 . 大洞康嗣、辻 康之 : 「空気に安定なトリアルキルホスフィン前駆体」 『化学』、**57** : 56-57 (2002)
- 3 . 辻 康之、徳永 信、大洞康嗣 : 「研究室紹介」、『オーガノメタリックニュース』、(3) : 100-101 (2002)

Laboratory of Metal Complex Catalysis

[ORIGINAL PAPERS]

- 1 . Sato, S., Ueda, K., Kawasaki, Y. and Nakamura, R. : "In situ IR observation of surface species during the photocatalytic decomposition of acetic acid over TiO₂ films", *J. Phys. Chem. B*, **106**(35) : 9054-9058 (2002) *
- 2 . Nakamura, R. and Sato, S. : "Oxygen species active for photooxidation of n-decane over TiO₂ surfaces", *J. Phys. Chem. B*, **106**(23) : 5893-5896 (2002) *
- 3 . Nakamura, R. and Sato, S. : "Surface-enhanced IR absorption of Pt and its application to in situ analysis of surface species", *Langmuir*, **18**(11) : 4433-4436 (2002) *
- 4 . Yabushita, A., Inoue, Y., Senga, T., Kawasaki, M. and Sato, S. : "Photodissociation of chlorine molecules adsorbed on amorphous and crystalline water ice films", *J. Phys. Chem. B*, **106**(12) : 3151-3159 (2002) *
- 5 . Sato, S. : "Photocatalysts sensitive to visible light", *Science*, **295**(5555) : 626-627 (2002) *

[REVIEWS]

- 1 . 佐藤真理 : 「半導体光触媒による環境浄化技術」、『化学装置』、**44** : 48-54 (2002)
- 2 . 佐藤真理、中村龍平 : 「表面増強赤外分光による半導体光触媒反応の研究」、『光化学』、**33** : 68-74

(2002)

- 3 . 佐藤真理：「表面増強赤外分光法による表面吸着種のその場観察」、『触媒』、**44** : 583-584 (2002)

[BOOKS]

- 1 . 佐藤真理：「NO_xをドーブした酸化チタンの可視光触媒活性」、『可視光利用技術最前線 色素増感型太陽電池と可視光応答型光触媒の最新技術』、藤島昭・橋本和仁監修(技術教育出版社、p. 93-99 (2002)
- 2 . Sato, S. : “Gas-phase water photolysis by NaOH-coated photocatalysts” in “Photocatalysis-Science and Technology-”, Eds. M. Kaneko and I. Okura, Kodansha-Springer, 223-234 (2002)

SECTION OF CATALYST EVALUATION (Visiting)

Laboratory of Catalyst Functions

[ORIGINAL PAPERS]

- 1 . Takahashi, Y., Sakami, H. and Nomura, M. : “Determination of the oxidation state of cerium in rocks by Ce L-III-edge X-ray absorption near-edge structure spectroscopy”, *Anal. Chim. Acta*, **468** (2): 345-354 (2002)*
- 2 . Ohta, A., Tsuno, H., Kagi, H. and Nomura, M. : “XAFS characterization of La and Nd coprecipitated with Mn dioxide and Fe oxyhydroxide”, *Geochimica et Cosmochimica Acta*, **66** (15A): A570-A570 Suppl. 1 (2002)*
- 3 . Yamaguchi A, Suzuki A, Shido T, Inada Y, Asakura K, Nomura M, Iwasawa Y. : “In situ time-resolved energy-dispersive X-ray absorption fine structure study on the decarbonylation processes of Mo(CO)₆ entrapped in NaY and HY zeolites”, *J. Phys. Chem. B*, **106** (9) : 2415-2422 (2002)*
- 4 . Shido, T., Yamaguchi, A., Inada, Y., Asakura, K., Nomura, M. and Iwasawa, Y.: "Dispersive XAFS study on Cu and Mo species in zeolites during the catalyst preparation", *Topics in Catal.*, **18**(1-2), 53-58 (2002).*
- 5 . Takahashi, T., Usui, A., Okumura, K., Uruga, T., Nomura, M., Murakami, M. and Shimizu, H.: "Application of XANES for the determination of oxidation states of Co and Pb in natural ferromanganese nodules", *Chem. Lett.*, 366-367 (2002).*
- 6 . Yamanaka, I: “Reductive activation of O₂ and monooxygenation of hydrocarbon by Eu catalyst”, *Catalysis Serveys from Japan* 6 1/2 63-72 (2002)*
- 7 . Yamanaka, I., Funakawa, A. and Otsuka, K. : “Selective carbonylation of methanol to dimethyl carbonate by gas-liquid-solid boundary electrolysis”, *Chem. Lett.*, 448-449 (2002)*
- 8 . de Leon, RG., Yamanaka, I. And Otsuka, K. : “Electro-organic Synthesis of N-Hexyl Carbamate by Carbonylation of Methanol and Hexylamine with CO over Au Supported on Carbon anode”, *Chem. Lett.*, 764-765 (2002)*
- 9 . Yamanaka, I., Hashimoto, T. and Otsuka, K. : “Direct Synthesis of Hydrogen Peroxide (>1wt%) over the Cathode Prepared from Active Carbon and Vapor-Grown-Carbon-Fiber by a New H₂-O₂ Fuel Cell System”, *Chem. Lett.*, 852-853 (2002)*
- 10 . Yamanaka, I., Hasegawa, S. and Otsuka, K. : “Partial oxidation of light alkanes by reductive activated oxygen over the (Pd-black+ VO(acac)₂/VGCF cathode of H₂-O₂-cell system at 298K”, *Appl. Catal. A:General* 305-315 (2002)*
- 11 . Yamanaka, I. Nishikawa, K. Takenaka, S. Otsuka, K. : “Complete Hydrodechlorination of Chloro-Aromatics Catalyzed by Pd/TiO₂ with H₂”, *Study of Surface Science and Catalysis* (2002)*
- 12 . Otsuka, K. and Yamanaka, I. : 「隔膜電解セルを用いた気相電解合成」、『Electrochemistry』、**70**,1: 42-46 (2002)*

[BOOKS]

- 1 . 尾嶋正治編、「日本分光学会 測定法シリーズ40 極限状態を見る放射光アナリシス」学会出版センター(2002) 分担執筆 3.3 高速XAFSで構造変化を追う
- 2 . 太田俊明編、「X線吸収分光法 - XAFSとその応用」アイピーシー(2002). 分担執筆 4.1, 4.2, 4.3, 4.7節

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(2) 講演発表一覧及び国際会議発表一覧のうち、*印は招待講演を表す。