

研究期間全年度 研究業績

浅尾直樹 (東北大学原子分子材料化学高等研究機構、A01 班 公募班員)

1. 発表論文等 (査読付き論文, 著書, 総説等の発表状況)

- (1) Fabrication of Pd-Ni-P Metallic Glass Nanoparticles and Their Application as Highly Durable Catalysts in Methanol Electro-oxidation
Zhao, M.; Abe, K.; Yamaura, S.; Yamamoto, Y.; Asao, N.* *Chem. Mater.* **2014**, *26*, 1056-1961.
(10.1021/cm403185h)
- (2) The synergistic effect of nanoporous AuPd alloy catalysts on highly chemoselective 1,4-hydrosilylation of conjugated cyclic enones
Chen, Q.; Tanaka, S.; Fujita, T.; Chen, L.; Minato, T.; Ishikawa, Y.; Chen, M.; Asao, N.; Yamamoto, Y.; Jin, T.* *Chem. Commun.* **2014**, *50*, 3344-3346.
(10.1039/c3cc49524h)
- (3) Metal-Catalyzed Annulation Reactions for π -Conjugated Polycycles
Jin, T. ;* Zhao, J.; Asao, N.; Yamamoto, Y. *Chem. Eur. J.* in press.
(10.1002/chem.201304640)
- (4) Thieno[2,3-a]carbazole-based donor- π -acceptor organic dyes for efficient dye-sensitized solar cells
Zhao, J.; Jin, T. ;* Islam, A.; Kwon, E.; Akhtaruzzaman, Md.; Asao, N.; Han, L.; Alamry, K. A.; Kosa, S. A.; Asiri, A. Md; Yamamoto, Y. *Tetrahedron* in press.
(10.1016/j.tet.2014.01.001)
- (5) Cu-Catalyzed C-H Amination of Hydrofullerenes Leading to 1,4-Difunctionalized Fullerenes
Si, W; Lu, S; Bao, M; Asao, N.; Yamamoto, Y; Jin, T.* *Org. Lett.* **2014**, *16*, 620-623.
(10.1021/ol403573r)
- (6) Remarkable Catalytic Property of Nanoporous Gold on Activation of Diborons for Direct Diboration of Alkynes
Chen, Q.; Zhao, J.; Ishikawa, Y.; Asao, N.; Yamamoto, Y.; Jin, T.* *Org. Lett.* **2013**, *15*, 5766-5769.
(10.1021/ol4028013)
- (7) Pd-Catalyzed Cascade Crossover Annulation of o-Alkynylarylhalides and Diarylacetylenes Leading to Dibenzo[a,e]pentalenes
Zhao, J.; Oniwa, K.; Asao, N.; Yamamoto, Y.; Jin, T.* *J. Am. Chem. Soc.* **2013**, *135*, 10222-10225.

(10.1021/ja403382d)

- (8) Selective Aerobic Oxidation of Methanol in the Coexistence of Amines by Nanoporous Gold Catalyst: Highly Efficient Synthesis of Formamides

Tanaka, S.; Minato, T.; Ito, E.; Hara, M.; Kim, Y.; Yamamoto, Y.; Asao, N.* *Chem. Eur. J.* **2013**, *19*, 11832-11836.

(10.1002/chem.201302396)

- (9) Photoresponse on the desorption of an atomic hydrogen on titanium dioxide surface induced by a tip of scanning tunneling microscope

Minato, T.; Asao, N.; Yamamoto, Y.; Kawai, M.; Kim, Y.* *Chem. Lett.* **2013**, *42*, 942-943.

(10.1246/cl.130462)

- (10) Selective hydrosilylation of alkynes with nanoporous gold catalyst, Atomic origin of the high catalytic activity of nanoporous gold

Ishikawa, Y.; Yamamoto, Y.; Asao, N.* *Catal. Sci. Tech.* **2013**, *3*, 2902-2905.

(10.1039/c3cy00242j)

- (11) Single crystal biphenyl end-capped furan-incorporated oligomers: influence of unusual packing structure on carrier mobility and luminescence

Oniwa, K.; Kanagasekaran, T.; Jin, T.; Akhtaruzzaman, M.; Yamamoto, Y.; Tamura, H.; Hamada, I.; Shimotani, H.; Asao, N.; Ikeda, S.; Tanigaki, K.* *J. Mater. Chem. C* **2013**, *1*, 4163-4170.

(10.1039/c3tc30220b)

- (12) Theoretical Analysis on the Optoelectronic Properties of Single Crystals of Thiophene-furan-phenylene Co-Oligomers: Efficient Photoluminescence due to Molecular Bending

Tamura, H.*; Hamada, I.; Shang, H.; Oniwa, K.; Akhtaruzzaman, M.; Jin, T.; Asao, N.; Yamamoto, Y.; Kanagasekaran, T.; Shimotani, H.; Ikeda, S.; Tanigaki, K. *J. Phys. Chem. C* **2013**, *117*, 8072-8078.

(10.1021/jp400646n)

- (13) Nanorheological Mapping of Rubbers by Atomic Force Microscopy

Igarashi, T.*; Fujinami, S.; Nishi, T.; Asao, N.; Nakajima, K. *Macromolecules*, **2013**, *46*, 1916-1922.

(10.1021/ma302616a)

- (14) Alkaline peroxide treatment induces acquired unruly hair by apparently affecting distinct macrofibrils
Nawa, T.;* Kawaguchi, A.; Kitano, H.; Yamamoto, T.; Fujinami, S.; Asao, N.; Nakajima, K. *J. Soc. Cosmet. Chem.* **2013**, *64*, 261-271.
- (15) Structure-property relationship of different electron donors: novel organic sensitizers based on fused dithienothiophene π -conjugated linker for high efficiency dye-sensitized solar cells
Akhtaruzzaman, Md.; Menggenbateer, Islam, A.;* El-Shafei, A.;* Asao, N.; Jin, T.; Han, L.; Alamry, K. A.; Kosa, S. A.; Asiri, A. M.; Yamamoto, Y.* *Tetrahedron* **2013**, *69*, 3444-3450.
(10.1016/j.tet.2013.02.058)
- (16) Unsupported Nanoporous Gold Catalyst for Highly Selective Hydrogenation of Quinolines
Yan, M.; Jin, T.;* Chen, Q.; Ho, H. E.; Fujita, T.; Chen, L.-Y.; Bao, M.; Chen, M.-W.; Asao, N.; Yamamoto, Y. *Org. Lett.* **2013**, *15*, 1484-1487.
(10.1021/ol400229z)
- (17) Atomic origin of the high catalytic activity of nanoporous gold
Fujita, T.;* Guan, P. F.; McKenna, K.; Lang, X. Y.; Hirata, A.; Zhang, L.; Tokunaga, T.; Arai, S.; Yamamoto, Y.; Tanaka, N.; Ishikawa, Y.; Asao, N.; Yamamoto, Y.; Chen, M. W.* *Nature Materials*, **2012**, *11*, 775-780.
(10.1038/NMAT3391)
- (18) From molecular catalysts to nanostructured materials skeleton catalysts
Asao, N.; Jin, T.; Tanaka, S.; Yamamoto, Y. *Pure Appl. Chem.* **2012**, *84*, 1771-1784.
(10.1351/PAC-CON-11-10-28)
- (19) Nanoporous Gold Catalyst for Highly Selective Semihydrogenation of Alkynes: Remarkable Effect of Amine Additives
Yan, M.; Jin, T.;* Ishikawa, Y.; Minato, T.; Fujita, T.; Chen, L.-Y.; Bao, M.; Asao, N.; Chen, M.-W.; Yamamoto, Y. *J. Am. Chem. Soc.* **2012**, *134*, 17536-17542.
(10.1021/ja3087592)
- (20) Aerobic oxidation of alcohols in the liquid phase with nanoporous gold catalysts
Asao, N.;* Hatakeyama, N.; Menggenbateer, Minato, T.; Ito, E.; Hara, M.; Kim, Y.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. *Chem. Commun.* **2012**, *48*, 4540-4542.
(10.1039/c2cc17245c)
- (21) Donor-acceptor Dyes Incorporating Stable Dibenzosilole π -Conjugated Spacer for Dye-sensitized Solar Cells

- Akhtaruzzaman, Md.*; Seya, Y.; Asao, N.; Islam, A.; Kwon, E.; El-Shafei, A.; Han, L.; Yamamoto, Y.* *J. Mater. Chem.* **2012**, *22*, 10771-10778.
(10.1039/c2jm30978e)
- (22) Nanoporous Gold-Catalyzed [4+2] Benzannulation between *ortho*-Alkynylbenzaldehydes and Alkynes
Asao, N.*; Menggenbateer, Seya, Y.; Yamamoto, Y.*; Chen, M.; Zhang, W.; Inoue, A. *Synlett* **2012**, *23*, 66-69.
(10.1055/s-0031-1289527)
- (23) A novel metal-free panchromatic TiO₂ sensitizer based on a phenylenevinylene-conjugated unit and an indoline derivative for highly efficient dye-sensitized solar cells
Akhtaruzzaman, Md.*; Islam, A.; Yang, F.; Asao, N.; Kwon, E.; Singh, S. P.; Han, L.; Yamamoto, Y.* *Chem. Commun.* **2011**, *47*, 12400-12402.
(10.1039/c1cc15580f)
- (24) Reusable and Sustainable Nanostructured Skeleton Catalyst: Heck Reaction with Nanoporous Metallic Pd (PdNPore) as a Support, Stabilizer and Ligand Free Catalyst
Kaneko, T.; Tanaka, S.; Asao, N.*; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. *Adv. Synth. Catal.* **2011**, *353*, 2927-2932.
(10.1002/adsc.201100358)
- (25) Formation and properties of Au-based nanograined metallic glasses
Chen, N.; Frank, R.; Asao, N.; Louzguine-Luzgin, D. V.*; Sharma, P.; Wang, J. Q.; Xie, G. Q.; Ishikawa, Y.; Hatakeyama, N.; Lin, Y. C.; Esashi, M.; Yamamoto, Y.; Inoue, A.* *Acta Mater.* **2011**, *59*, 6433-6440.
(10.1016/j.actamat.2011.07.007)
- (26) Gold-catalyzed alkylation of silyl enol ethers with *ortho*-alkynylbenzoic acid esters
Aikawa, H.; Kaneko, T.; Asao, N.*; Yamamoto, Y. *Beilstein J. Org. Chem.* **2011**, *7*, 648-652.
(10.3762/bjoc.7.76)
- (27) A nanostructured skeleton catalyst: Suzuki-coupling with a reusable and sustainable nanoporous metallic glass Pd-catalyst
Tanaka, S.; Kaneko, T.; Asao, N.*; Yamamoto, Y.*; Chen, M.; Zhang, W.; Inoue, A. *Chem. Commun.* **2011**, *47*, 5985-5987.
(10.1039/c1cc10710k)
- (28) Stat3 as a Therapeutic Target for the Treatment of Psoriasis: A Chiral Feasibility Study with STA-21, a Stat3 Inhibitor

Miyoshi, K.; Takaishi, M.; Nakajima, K.; Ikeda, M.; Kanda, T.; Tarutani, M.; Iiyama, T.; Asao, N.; DiGiovanni, J.; Sano, S.* *J. Invest. Dermatology* **2011**, *131*, 108-117. (10.1038/jid.2010.255)

(29) Nanostructured Materials as Catalysts: Nanoporous-Gold-Catalyzed Oxidation of Organosilanes with Water

Asao, N.*; Ishikawa, Y.; Hatakeyama, N.; Menggenbateer, Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. *Angew. Chem. Int. Ed.* **2010**, *49*, 10093-10095. (10.1002/anie.201005138)

(30) Gold-catalyzed C-S bond formation from thiols

Jean, M.; Renault, J.; van de Weghe, P.*; Asao, N. *Tetrahedron Lett.* **2010**, *51*, 378-381. (10.1016/j.tetlet.2009.11.025)

その他、査読無しの著作の場合

(31) Gold-Catalyzed Addition of Heteroatom Nucleophile to C-C Multiple Bond

Asao, N.; Hatakeyama, N.; Yamamoto, Y. In *Gold Catalysis: An Homogeneous Approach (Catalytic Science Series)*, Toste, F. D.; Michelet, V. Eds.; Imperial College Press, 2014, Chapter 4. (ISBN-13: 978-1848168527)

(32) Formal [4+2] Benzannulation via Pyrylium Intermediates

Asao, N.; Ishikawa, Y. In *Transition-Metal-Mediated Aromatic Ring Construction*, Tanaka, K. Ed.; Wiley, 2013, Chapter 15, pp 379-398.

(33) Gold-Catalyzed Benzannulations: Asao-Yamamoto Benzopyrylium Pathway

Asao, N.; Yamamoto, Y. In *Modern Gold Catalyzed Synthesis*, Hashmi, A. S. K.; Toste, F. D. Eds. Wiley, 2012, Chapter 3, pp 55-73.

(34) Allyltrimethylsilane

Fleming, I.; Asao, N. In *Handbook of Reagents for Organic Synthesis: Reagents for Silicon-Mediated Organic Synthesis*, Fuchs, P. L., Ed.; Wiley, 2011, pp 14-23.

(35) ナノ多孔質金属材料を用いた触媒反応

浅尾直樹*, 金 鉄男, 触媒, 2013, 55 (4), 209-213.

2. 学会発表等 (国内外の招待講演および国際会議での発表状況)

(1) Nanoporous Gold as an Effective Catalyst for Selective Molecular Transformations

Asao, N. Sixth Joint Workshop on Frontier Materials, Sendai, Japan, 2013.12. 1-5 (招待講演) .

(2) ナノ多孔質金属材料の開発と触媒機能評価

浅尾直樹, 第三回ナノコンポジット材料によるセンサー研究会, 盛岡, 2013. 2. 1

(招待講演) .

- (3) Facile access to soluble Pt-Au porous nanoparticles and its extension to high performance electrocatalyst

Asao, N. Fifth Joint Workshop on Frontier Materials (FRONTIER 2012), Rennes, France, 2012.12. 2-6 (招待講演) .

- (4) Nanoporous Gold as a Nanostructured Skeleton Catalyst for Molecular Transformations

Asao, N. The Twelfth International Kyoto Conference on New Aspect of Organic Chemistry (IKCOC-12), Kyoto, Japan, 2012.11.12-16 (口頭発表) .

- (5) Nanoporous Gold as a Skeleton Catalyst for Molecular Transformations

Asao, N.; Tanaka, S.; Minato, T.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. The 3rd Advanced Materials Development and Integration of Novel Structured Metallic and Inorganic Materials (AMDI3), Toyohashi, Japan, 2012.11.5-8 (招待講演) .

- (6) Nanoporous Gold as a Skeleton Catalyst for Aerobic Oxidation of Alcohols

Asao, N. 1st International Conference on Emerging Advanced Nanomaterials (ICEAN), Brisbane, Australia, 2012.10.22-25 (招待講演) .

- (7) Aerobic Oxidation of Alcohols with Nanoporous Gold Catalyst

Asao, N. 17th Malaysian Chemical Congress (17MCC), Kuala Lumpur, Malaysia, 2012.10.15-17 (招待講演) .

- (8) Aerobic Oxidation of Alcohols Catalyzed by Nanoporous Gold

Asao, N.; Hatakeyama, N.; Minato, T.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. The 6th International Conference on Gold Science Technology and its Applications (Gold 2012), Tokyo, Japan, 2012.9.6-8 (ポスター発表) .

- (9) Nanoporous gold as a heterogeneous catalyst for the oxidation of organosilanes with water

Ishikawa, Y.; Asao, N.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. The 6th International Conference on Gold Science Technology and its Applications (Gold 2012), Tokyo, Japan, 2012.9.6-8 (ポスター発表) .

- (10) Nanostructured Materials as Skeleton Catalysts for Molecular Transformations

Asao, N. International Scientific Forum of Young Scientists of Asian-Pacific Region, Vladivostok, Russia, 2012.5.14-17 (招待講演) .

- (11) Nanoporous Gold as a Catalyst for the Oxidation of Organosilanes and Alcohols

Ishikawa, Y.; Hatakeyama, N.; Asao, N.; Yamamoto, Y.; Mingwei, C.; Zhang, W.; Inoue, A. International Association of Colloid and Interface Scientists, Conference (IACIS 2012), Sendai, Japan, 2012.5.13-18 (ポスター発表) .

- (12) Aerobic Oxidation of Alcohols Catalyzed by Nanoporous Gold
Hatakeyama, N.; Menggenbateer; Asao, N.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. 16th IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS 16), Shanghai, China, 2011.7.24-28 (ポスター発表) .
- (13) Nanoporous gold as a catalyst for the oxidation of organosilanes
Ishikawa, Y.; Hatakeyama, N.; Menggenbateer; Asao, N.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. 16th IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS 16), Shanghai, China, 2011.7.24-28 (ポスター発表) .
- (14) Nanostructured Skeleton Catalyst: Suzuki-coupling and Heck Reaction with Nanoporous Pd-catalyst as a Non-supported Catalyst
Tanaka, S.; Kaneko, T.; Asao, N.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. 16th IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS 16), Shanghai, China, 2011.7.24-28 (ポスター発表) .
- (15) Nanoporous Gold Catalyzed Benzannulation Reaction
Menggenbateer; Asao, N.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. 16th IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS 16), Shanghai, China, 2011.7.24-28 (ポスター発表) .
- (16) Nanoporous Metallic Materials as Effective Green Catalysts for Molecular Transformations
Asao, N. 14th Asian Chemical Congress 2011 (14 ACC), Bangkok, Thailand, 2011.9.5-8 (招待講演) .
- (17) Integrated Aerobic Oxidation of Alcohols Catalyzed by Nanoporous Gold
Asao, N.; Hatakeyama, N.; Yamamoto, Y. The Seventh International Symposium on Integrated Synthesis (ISIS-7), Kobe, Japan, 2011.10.9-10 (ポスター発表) .
- (18) Nanoporous Metals as Effective Catalysts for Molecular Transformations
Asao, N. Tateshina Conference on Organic Chemistry 2011, Tateshina, Japan, 2011.11.11-13 (ポスター発表) .
- (19) Molecular transformation with nanoporous materials skeleton catalysts
Asao, N. 4th French Research Organizations-Tohoku University Joint Workshop on Frontier Materials and Processes (Frontier 2011), Sendai, Japan, 2011.12.4-7 (招待講演) .
- (20) Atomic defect control on titanium dioxide surface by scanning tunneling microscopy
Minato, T.; Pang, C.-L.; Kajita, S.; Asao, N.; Yamamoto, Y.; Nakayama, T.; Kawai, M.; Kim, Y. International Symposium on Surface Science (ISSS-6), Tokyo, Japan, 2011.12.11-15 (ポスター発表) .

- (21) Nanoporous materials as skeleton catalysts for molecular transformations
Asao, N. UCSB ICMR/CNSI and Tohoku University Joint Workshop, Santa Barbara, USA, 2012.1.10-12 (招待講演) .
- (22) Aerobic Oxidation of Alcohols in the Liquid Phase with Nanoporous Gold Catalysts
Asao, N.; Hatakeyama, N.; Minato, T.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, The 2012 WPI-AIMR Annual Workshop, Sendai, Japan, 2012. 2.20-23 (ポスター発表) .
- (23) Nanoporous Palladium as a Reusable Skeleton Catalyst for Suzuki Coupling and Heck Reaction
Tanaka, S.; Kaneko, T.; Asao, N.; Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. The 2012 WPI-AIMR Annual Workshop, Sendai, Japan, 2012. 2.20-23 (ポスター発表) .
- (24) Mechanism of organic chemical reactions on nano-porous gold
Minato, T.; Ito, E.; Ishikawa, Y.; Hatakeyama, N.; Hara, M.; Kim, Y.; Asao, N.; Yamamoto, Y. Towards Reality in Nanoscale Materials V, Levi, Finland, 2012.2.20-22 (ポスター発表) .
- (25) Nanoporous Metallic Materials as Effective Green Catalysts for Molecular Transformations
Asao, N. The 2011 WPI-AIMR Annual Workshop, Sendai, Japan, 2011.2.21-24 (招待講演) .
- (26) Oxidation of alcohols with molecular oxygen catalyzed by reusable nanoporous gold
Asao, N.; Ishikawa, Y.; Hatakeyama, N.; Menggenbateer, Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. The 2010 International Chemical Congress of Pacific Basin Societies (Pacifichem 2010), Honolulu, Hawaii, USA, 2010.12.15-20 (口頭発表) .
- (27) Gold-catalyzed functionalization of silyl enol ethers
Kaneko, T.; Aikawa, H.; Asao, N. The 2010 International Chemical Congress of Pacific Basin Societies (Pacifichem 2010), Honolulu, Hawaii, USA, 2010.12.15-20 (ポスター発表) .
- (28) Gold-catalyzed dehydration of alcohols
Seya, Y.; Umetsu, K.; Asao, N. The 2010 International Chemical Congress of Pacific Basin Societies (Pacifichem 2010), Honolulu, Hawaii, USA, 2010.12.15-20 (ポスター発表) .
- (29) Individual Hydrogen Desorption from Titanium Dioxide Surfaces
Minato, T.; Pang, C.-L.; Asao, N.; Yamamoto, Y.; Kawai, M.; Kim, Y. Asian Conference on Nanoscience & Nanotechnology (AsiaNANO 2010), Tokyo, Japan, 2010.11.1-3 (ポスター発表) .

(30) Gold-catalyzed dehydration of alcohols

Seya, Y.; Umetsu, K.; Asao, N. 24th International Conference on Organometallic Chemistry (ICOMC 2010), Taipei, Taiwan, 2010.7.18-23 (ポスター発表) .

(31) Nanoporous Gold as an Effective Heterogeneous Catalyst for Molecular Transformations

Asao, N.; Ishikawa, Y.; Hatakeyama, N.; Menggenbateer, Yamamoto, Y.; Chen, M.; Zhang, W.; Inoue, A. WCU/AMS (POSTECH)-WPI/AIMR (TOHOKU Univ) Joint Workshop, Pohang, Korea, 2010.6.17-19 (招待講演) .

3. 特許

(1) ナノ金属ガラス粒子集合体の製造方法

国立大学法人東北大学, 陳娜, ルズギン-ドミトリ-ヴァレンチノヴィッチ, 井上明久, 浅尾直樹, 山本嘉則

特開 2012-255197, 2012.12.27

4. 学会・シンポジウム等の開催状況

5. 受賞等

(1) 男庭一輝 (博士1年)

優秀ポスター賞 第2回 CSJ 化学フェスタ 2012、2012.10.14-17

(2) 顔美 (博士3年)

Springer Theses シュプリンガー、2013.3.15

(3) 顔美 (博士3年)

青葉理学振興会賞 青葉理学振興会、2013.3.15

(4) 顔美 (博士3年)

東北大学総長賞 東北大学、2013.3.27

6. 新聞報道等

(1) Active Sites In Gold Foam Revealed, *Chemical & Engineering News*, **2012**, 90 (34), 29, Concentrates

7. 国民との科学・技術対話

セミナー：文科省分子・物質合成 PF 平成 25 年度第 1 会セミナーin 仙台

主催：ナノテクノロジープラットフォームセンター

(独立行政法人科学技術振興機構／独立行政法人物質・材料研究機構)

共催：国立大学法人東北大学（ナノテクノロジープラットフォーム 実施機関）

後援：宮城県、仙台市、東北経済産業局、一般社団法人東北経済連合会

場所：TKP ガーデンシティ仙台

講演内容：大学における研究成果の紹介

対象者：一般市民 人数：100 名 日時：2013 年 11 月 12 日

8. 領域内の共同研究の準備・実施状況とその成果

(1) 共同研究先：九州大学，大石研究室（A03 班，公募班員）

派遣人員（派遣）：なし

派遣期間（派遣）：なし

共同研究内容：天然物の集積合成

共同研究成果：多孔質金触媒は、アルコールの酸素酸化やアルキンからアルケンへの還元反応において優れた触媒活性と選択性を示す新しい固体触媒である。現在天然物合成における本触媒の有用性を明らかにするため共同研究の準備中である。