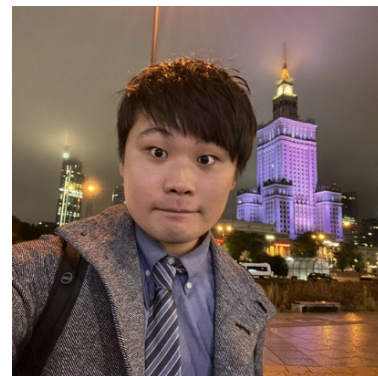


Yuya Harada

Research Fellow of Japan Society for the Promotion of Science (DC2)
& Ph.D. Student

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Personal Data

Date of Birth:	September 16 th , 1996
Sex:	Male
Nationality:	Japan

Language

Japanese:	Mother Tongue
English:	Intermediate

Specialized Fields

Electrochemistry (primary major)

Electrocatalysis

- Hydrogen evolution reaction, Carbon dioxide reduction reaction

Electrodeposition & Electropolymerization

- Metals, Conductive polymers, Hybrids of metals and organics

Experiences

2022 Apr. – Now	Research Fellow of Japan Society for the Promotion of Science (DC2)
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Education

- 2021 Apr. – Now** **Yamagata University (YU), Japan**
[Ph.D student]
Graduate School of Organic Materials Science
Department of Organic Materials Science
Ph.D. student

Supervisor: Professor Tsukasa Yoshida
- 2019 Apr. – 2021 Mar.** **Yamagata University (YU), Japan**
[Master's degree of engineering]
Graduate School of Science and Engineering
Department of Chemistry and Chemical Engineering

Supervisor: Professor Tsukasa Yoshida
- 2012 Apr. – 2019 Mar.** **National Institute of Technology, Tokyo College (NITTC), Japan**
[Bachelor's degree of engineering]
Advanced Courses of Material Engineering
Department of Material Engineering

Supervisor: Professor Hidenobu Shiroishi
- 2012 Apr. – 2019 Mar.** **National Institute of Technology, Tokyo College (NITTC), Japan**
[Associate's degree of engineering]
Department of Material Engineering

Supervisor: Professor Hidenobu Shiroishi

External Research Experiences

- **Japan Atomic Energy Agency Nuclear Science and Engineering Center, Japan**
(2 weeks, 2015 Sep 1st – 2015 Sep 14th)
Subject: Analysis of Precipitates of Continuous Solvent Extraction of Actinide Metals
Supervisor: Dr. Masayuki Watanabe
- **Tokyo Institute of Technology, Japan**
(1 month, 2017 Jul. 21st – 2017 Aug. 31st)
Subject: Photochemical Decomposition of Toxic Materials by p-n Junction Photo-Electrocatalysts
Supervisor: Associate Professor Keiji Nagai
- **Institute of Physical Chemistry and Linz Institute for Organic Solar Cells (LIOS), Johannes Kepler University Linz (JKU), Austria**
(2 months, 2020 Feb. 1st – 2020 Mar. 15th)

Subject: HER Electrocatalysis of electropolymerized polydopamine

Supervisor: Assistant Professor Philipp Stadler and Professor Niyazi Serdar Sariciftci

- **University of Illinois at Urbana-Champaign, United State of America (9 months, 2022 Jun. 12th – 2023 Mar. 12th)**

Subject: HER Electrocatalysis of electropolymerized polydopamine

Supervisor: Professor Andrew A. Gewirth

Research Experiences / Skills

A. Development of Cocatalyst of Pyrochlore Metal Oxides for Hydrogen Oxidation Reaction (HOR) Toward Photochemical Water Splitting (about 1 years in NITTC)

- Synthesis of Visible Light Responsive ZnO-GaN and pyrochlore type nano particles by calcinations
- Material characterization of metal oxide materials by X-ray diffraction (XRD), scanning electron microscope (SEM) and X-ray photon spectroscopy (XPS)
- Photocatalytic waterer splitting test: Quantitative measurement of generated hydrogen and oxygen by gas chromatograph (GC)

B. Development of Electrocatalysts using facet-controlled nano-metals for Ammonia Oxidation Reaction (AOR) (about 3.5 years in NITTC)

- Synthesis of facet controlled nano particles of Cu, Pt and Ir by microwave synthesis and reflux synthesis.
- Material characterization of metal nanoparticles by Transmission electron microscope (TEM), atomic force microscope (AFM) and XRD, SEM.
- Catalytic performance evaluation of AOR by electrochemical measurements

C. Study of Poisoning of AOR on Pt and Ir (about 3.5 years in NITTC)

- Kinetic analysis of atomic N poisoning of AOR by a special electrochemical technic (normal pulse voltammetry)

D. Hydrogen Bonding Conductive Polymer Electrocatalysts for Hydrogen Evolution Reaction (HER) and CO₂ reduction reaction (CO₂RR) Electrocatalysis (about 4 years in YU and JKU)

- Synthesis of π conjugated conductive polymers film by chemical vapor deposition or electropolymerization
- Material Characterization of polymer film by UV/Vis Spectroscopy (UV/Vis), Fourier Transform Infrared Spectroscopy (FT-IR), SEM.
- Density functional theory (DFT) calculation of monomeric molecules and polymers
- Electrochromic behavior analysis by *In-situ* UV-vis spectroelectrochemical measurements.
- Electrocatalytic evaluation for HER and CO₂RR

E. Electrodeposition of Fractal Structured Nickel Thin Films for HER in Alkaline Media (about 1 years in UIUC and YU)

- Electrodeposition in the presence of an organic additive for morphology control
- Material Characterization of Ni film by XRD, and SEM
- Electrocatalytic evaluation for HER in alkaline media

F. Polymer/Metal Hybrid-Electrocatalysts for CO₂RR Electrocatalysis (about 1 years in YU)

- Electrodeposition of polymer/metal hybrid-film
- Material Characterization of polymer film by UV/Vis Spectroscopy (UV/Vis), Fourier Transform Infrared Spectroscopy (FT-IR), SEM.
- Electrocatalytic evaluation for HER and CO₂RR

Research Achievements

Publications

- (1) Ooya, K.; Shiroishi, H.; Harada, Y. Development of a Software to Analyze the Dispersion State of Particles on a Flat Substrate. *Journal of Computer Chemistry, Japan -International Edition* **2016**, 2. DOI: 10.2477/jccjie.2016-0009.
- (2) Harada, Y.; Yoshida, T. Hydrogen-Bonding Conductive Polymer Electrocatalysts for Conversion and Storage of Renewable Electricity. *POLYMERS* **2021**, 70 (11), 2.
- (3) Kobayashi, T.; Watanabe, Y.; Khosla, A.; Kawakami, M.; Shiblee, M. D. N. I.; Ogawa, J.; Nakamura, T.; Harada, Y.; Yoshida, T.; Furukawa, H. 3D Printing of Capacitor Using Ionic Liquid Gel. *ECS Transactions* **2022**, 107 (1), 20235. DOI: 10.1149/10701.20235ecst.
- (4) Dimitriev, O.; Harada, Y.; Sharanov, I.; Ishchenko, A.; Yoshida, T. Improved sensing of metal ions via abnormal enhancement of the anti-stokes emission of the near-infrared fluorescent probe. *Journal of Photochemistry and Photobiology A: Chemistry* **2023**, 445, 115104. DOI: <https://doi.org/10.1016/j.jphotochem.2023.115104>.
- (5) Sun, L.; Yoshida, T.; Harada, Y.; White, M. S.; Suzuri, Y. Amorphous dielectric metal-organic electron injection layer for efficient inverted organic light-emitting diodes. *Org Electron* **2023**, 106878. DOI: <https://doi.org/10.1016/j.orgel.2023.106878>.
- (6) Harada, Y.; Kono, D.; Shiroishi, H.; Stadler, P.; Watanabe, R.; Dai, X.; Yoshida, T. Electrocatalysis of Poly-Neutral Red for Hydrogen Evolution Reaction in Acidic Media. *Electrochemistry* **2024**, 92 (2), 027002-027002. DOI: 10.5796/electrochemistry.23-00130.
- (7) Harada, Y., Hua, Q., Harris, L., Yoshida, T., Gewirth, A. Electrodeposition of Fractal Structured Nickel for Hydrogen Evolution Reaction in Alkaline *ChemElectroChem* **2024** (Accepted)
- (7) Harada, Y., Kono, Daiki., Yoshida T. DNA-inspired Polymers as Metal-free Electrocatalysts for Hydrogen Evolution Reaction in Acidic Media *Molecular Catalysis* **2024** (In preparation)

Conferences

- (1) 原田祐弥; 平出有吾; 羽生真也; 城石英伸. Pb₂Ru₂O_{7-δ}のAサイトをSnまたはYbで置換することによる水の光分解活性への影響. In 第17回化学工学会学生発表会, 八戸市 青森県 日本; 2015.
- (2) 原田祐弥; 大屋彼野人; 白坂亮; 城石英伸; 蒲生-西谷美香; 長井圭治. Pt担持多層カーボンナノチューブ触媒の酸素還元およびアンモニア酸化触媒活性に与える分散法の影響(2). In 電気化学会 83回大会, 吹田市 大阪府 日本; 2016.

- (3) Harada, Y.; Ooya, K.; Shirasaka, R.; Shiroishi, H.; Nishitani-Gamo, M.; Nagai, K. Effect of Dispersion Methods on Oxygen Reduction and Ammonia Oxidation Reactions for Multiwall Carbon Nanotube Supported Pt. In Pacific Rim Meeting on Electrochemical and Solid-State Science (PRiME) 2016, Honolulu Hawaii USA; 2016.
- (4) Ooya, K.; Shiroishi, H.; Harada, Y. Development of a Software to Analyze the Dispersion State of Particles on a Flat Substrate. In Pacific Rim Meeting on Electrochemical and Solid-State Science (PRiME) 2016, Honolulu Hawaii USA; 2016.
- (5) Shirasaka, R.; Shiroishi, H.; Harada, Y.; Nishitani-Gamo, M.; Nagai, K. Study of the Ammonia Oxidation Mechanism by a Normal Pulse Voltammetry. In Pacific Rim Meeting on Electrochemical and Solid-State Science (PRiME) 2016, Honolulu Hawaii USA; 2016.
- (6) 原田祐弥; 城石英伸; 晋矢, 山.; 齋藤守弘. 貴金属ディスク電極上でのアンモニア酸化時に生成する窒素被毒種の脱離過程の研究(1). In 電気化学会 84 回大会, 八王子市 東京 日本; 2017.
- (7) 檜垣龍太郎; 原田祐弥; 城石英伸. 超音波照射によって生じるヒドロキシラジカルの定量とその教材作成. In 電気化学会 84 回大会, 八王子市 東京 日本; 2017.
- (8) 原田祐弥; 城石英伸; 山田晋矢; 齋藤守弘. Ir/MWCNT および Pt シェル-Ir コア/MWCNT 上でのアンモニア酸化時に生成する窒素被毒種の脱離過程の解析. In 2017 年 電気化学秋季大会, 長崎市 長崎県 日本; 2017.
- (9) 原田祐弥; 城石英伸; 山田晋矢; 齋藤守弘. Ir/MWCNT および Pt シェル-Ir コア/MWCNT 上でのアンモニア酸化時に生成する窒素被毒種のノーマルパルスボルタンメトリーによる解析. In 第 10 回新電極シンポジウム&宿泊シンポジウム, 三島市 静岡県 日本; 2017.
- (10) 原田祐弥; 城石英伸; 山田晋矢; 齋藤守弘. Pt 族ナノ粒子上でのアンモニア酸化時に生成する窒素被毒種の脱離過程のノーマルパルスボルタンメトリーによる解析(1). In 2017 年度 有機エレクトロニクス研究会 (OME), 港区 東京都 日本; 2017.
- (11) 原田祐弥; 城石英伸; 高橋圭太郎; 関志朗; 山田晋矢; 守弘, 齋. Pt/C 上でのアンモニア酸化時に生成する窒素被毒種の脱離過程の解析. In 電気化学会 85 回大会, 葛飾区 東京都 日本; 2018.
- (12) Harada, Y.; Shiroishi, H.; Baba, K.; Kinoshita, Y.; Tatemichi, K.; Saito, M. Improvement of the Diffusion Coefficient and Concentration of O₂ in Nafion® with 2,2'-bpy. In First International Conference on 4D Materials and Systems, Yonezawa Yamagata Japan; 2018.
- (13) Harada, Y.; Shiroishi, H.; Saito, M. Study of Desorption Process of Nitrogen Poisoning Species Generated during Ammonia Oxidation on Pt/C. In Americas International Meeting on Electrochemistry and Solid State Science (AiMES) 2018, Cancun, Quintana Roo, Mexico; 2018.
- (14) Harada, Y.; Nishiumi, N.; Stadler, P.; Shiroishi, H.; Tsukasa, Y. Electrochemical CO₂ Reduction Catalytic Activity Comparison of Polydopamine on Various N-doped Carbon Substrates. In Smart System Engineering 2019 (Smasys2019), Yonezawa Yamagata Japan; 2019.
- (15) Harada, Y.; Nishiumi, N.; Stadler, P.; Shiroishi, H.; Yoshida, T. Electrochemical CO₂ Reduction Catalytic Activity Comparison of Polydopamine on Various N-doped Carbon Substrates. In Nanjing University-Yamagata University Students Workshop, Nanjing, Jiangsu, China; 2019.
- (16) 原田祐弥; 西海信之; Philipp, S.; 城石英伸; 吉田司. N ドープカーボン基板による PDA の CO₂RR 活性向上の研究. In 電気化学会東北支部 第 32 回若手の会, 天童市 山形県 日本; 2019.
- (17) Harada, Y.; Kaiwa, H.; Huang, X.; Coskun, H.; Aljabour, A.; Stadler, P.; Yoshida, T. Electro-Polymerization of Hydrogen-Bonding Conductive Polymers As Metal-Free Electrocatalysts for Energy Conversion. In 237th ECS Meeting, Montreal Quebec Canada; 2020.
- (18) Huang, X.; Harada, Y.; Nishiumi, N.; Coskun, H.; Aljabour, A.; Stadler, P.; Yoshida, T. Synthesis of Poly-Neutral Red and Its Electrocatalytic Property Towards CO₂ Reduction Reaction. In 237th ECS Meeting, Montreal Quebec Canada; 2020.
- (19) Nishiumi, N.; Harada, Y.; Sun, H.; Shiroishi, H.; Matsushima, Y.; Stadler, P.; Yoshida, T. Microwave-Assisted Hydrothermal Synthesis of Transition Metal Doped ZnO Nanoparticles and Their Electrocatalytic Activity for Water Oxidation. In 237th ECS meeting, Montreal Quebec Canada; 2020.

- (20) 西澤菜々美; 城石英伸; 川口楓; 原田祐弥; 吉田司. 高効率二酸化炭素電解還元に向けたシトシン由来非金属触媒の合成と活性評価. In 2020 年度 (令和 3 年度) 日本太陽エネルギー学会研究発表会, オンライン; 2020.
- (21) Harada, Y.; Kaiwa, H.; Huang, X.; Stadler, P.; Konno, R.; Shiroishi, H.; Yoshida, T. Electrochemical Co-Polymerization of Neutral Red and Aniline for Electrocatalytic Hydrogen Evolution Reaction. In Pacific Rim Meeting on Electrochemical and Solid-State Science (PRiME) 2020, Honolulu Hawaii USA; 2020.
- (22) Huang, X.; Harada, Y.; Nishiumi, N.; Coskun, H.; Aljabour, A.; Stadler, P.; Konno, R.; Shiroishi, H.; Yoshida, T. The Study of Synthesis Mechanism of Poly-Neutral Red and Its Electrocatalytic Property. In Pacific Rim Meeting on Electrochemical and Solid-State Science (PRiME) 2020, Honolulu Hawaii USA; 2020.
- (23) Kaiwa, H.; Harada, Y.; Stadler, P.; Yoshida, T. Conducting Poly-Adenine Electrocatalyst for Hydrogen Evolution Reaction. In Pacific Rim Meeting on Electrochemical and Solid-State Science (PRiME) 2020, Honolulu Hawaii USA; 2020.
- (24) 原田祐弥; 貝和春香; Philipp, S.; 今野龍刀; 城石英伸; 吉田司. アニリン/ニュートラルレッド電解共重合体の製膜と水素発生反応電極触媒機能. In 電気化学会東北支部 第 33 回若手の会, オンライン; 2020.
- (25) 今野龍刀; 城石英伸; 白石美佳; 蒲生西谷美香; 原田祐弥; 吉田司. 貴金属担持 $\text{TiO}_2\text{-xN}_x$ ナノ粒子触媒を用いた低温常圧下における電気化学的窒素還元(3). In 電気化学会第 88 回大会, オンライン; 2021.
- (26) 新奥孝太; 西澤菜々美; 城石英伸; 原田祐弥; 吉田司. 含アミノ化合物由来非金属触媒の電解二酸化炭素還元性能の評価と電解セルの改良検討. In 電気化学会第 88 回大会, オンライン; 2021.
- (27) 原田祐弥; 河野大樹; Philipp, S.; 新奥孝太; 城石英伸; 吉田司. ポリニュートラルレッド修飾電極の水素発生触媒機能. In 第 16 回 有機デバイス・物性院生研究会, オンライン; 2021.
- (28) 原田祐弥; 河野大樹; Philipp, S.; 新奥孝太; 城石英伸; 吉田司. ポリニュートラルレッド修飾電極の水素発生触媒機能. In 2021 年電気化学秋季大会, オンライン; 2021.
- (29) 原田祐弥; 河野大樹; Philipp, S.; 新奥孝太; 城石英伸; 吉田司. ポリニュートラルレッド修飾電極の水素発生触媒機能. In 電気化学会 東海支部 -東北支部合同シンポジウム, オンライン; 2021.
- (30) Harada, Y.; Kono, D.; Stadler, P.; Yoshida, T. Poly Neutral Red for Electrocatalytic Hydrogen Evolution Reaction. In First International Conference on Technologies for Smart Green Connected Society 2021, Online; 2021.
- (31) Kobayashi, T.; Watanabe, Y.; Khosla, A.; Kawakami, M.; Ogawa, J.; Nakamura, T.; Harada, Y.; Yoshida, T.; Furukawa, H. Capacitor of 3D printing used ionic liquid gel. In First International Conference on Technologies for Smart Green Connected Society 2021, Online; 2021.
- (32) 原田祐弥; 河野大樹; Dai, X.; Philipp, S.; 新奥孝太; 林出帆; 城石英伸; 吉田司. ポリニュートラルレッド修飾電極の水素発生触媒機能. In 電気化学会第 89 回大会, オンライン; 2022.
- (33) 新奥孝太; 林出帆; 城石英伸; 原田祐弥; 吉田司. 燃料電池型電解セルを用いた窒素ドーブ還元型酸化グラフェンの CO_2 還元能の評価. In 電気化学会第 89 回大会, オンライン; 2022.
- (34) 河野大樹; 原田祐弥; Dai, X.; Philipp, S.; 新奥孝太; 林出帆; 城石英伸; 吉田司. 電解重合法によるポリニュートラルレッド修飾電極の作成. In 電気化学会第 89 回大会, オンライン; 2022.
- (35) Harada, Y.; Kono, D.; Xinjie, D.; Yoshida, T. Hydrogen Evolution Reaction by Poly-Neutral Red Modified Electrocatalyst. In 2022 European Materials Research Society (E-MRS) Fall Meeting, Warszawa Poland; 2022.
- (36) Kono, D.; Harada, Y.; Xinjie, D.; Tsukasa, Y. Electropolymerization of neutral red. In 2022 European Materials Research Society (E-MRS) Fall Meeting, Warszawa Poland; 2021.
- (37) Harada, Y.; Kono, D.; Xinjie, D.; Yoshida, T. Hydrogen Evolution Reaction By Metal-Free Poly-Neutral Red Electrocatalyst. In 242nd ECS Meeting, Atlanta Georgia USA; 2022.
- (38) Kono, D.; Harada, Y.; Xinjie, D.; Yoshida, T. Electropolymerization of Neutral Red. In 242nd ECS Meeting, Atlanta Georgia USA; 2022.
- (39) Uda, K.; Harada, Y.; Nakamura, T.; Tsuda, Y.; Sun, L.; Suzuri, Y.; Yoshida, T. Tuning of Morphological, Crystallographic and Optoelectronic Properties in Electrodeposition of CuSCN for Device Applications. In 242nd ECS Meeting, Atlanta Georgia USA; 2022.

(40) 鷹取樹; 城石英伸; 河野大樹; 原田祐弥; 吉田司. 電析により調製した Cu/Ru/Ketjenblack-TiO₂/Carbon paper 触媒を用いた低温常圧下における電解窒素還元能. In 2022 年度 (令和 4 年度) 日本太陽エネルギー学会研究発表会, 福井市 福井県 日本; 2022.

(41) 新奥孝太; 城石英伸; 河野大樹; 原田祐弥; 吉田司. 燃料電池型セルを用いた有機触媒による電気化学的二酸化炭素還元. In 2022 年度 有機エレクトロニクス研究会 (OME), 葛飾区 東京都 日本; 2022.

(42) 河野大樹; 原田祐弥; Dai, X.; 吉田司. フェナジンおよびチアジン色素の電解重合反応. In 電気化学会第 90 回大会, 仙台市 宮城県 日本; 2023.

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(44) Harada, Y.; Kono, D.; Philipp, S.; Yoshida, T. Electropolymerized Polydopamine for Hydrogen Evolution Reaction Catalysis. In International Symposium for the 80th Anniversary of the Tohoku Branch of the Chemical Society of Japan & 2023 Joint Meeting of the Tohoku Area Chemistry Societies, Sendai Miyagi Japan; 2023.

(45) 原田祐弥; 河野大樹; Philipp, S.; 吉田司. 電解重合ポリドーパミン修飾電極の水素発生触媒機能. In 2023 電気化学会秋季大会, 福岡市 福岡 日本; 2023.

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Grants and Scholarship

1. Innovative Soft Matter Fellowship Program (The establishment of university fellowships towards the creation of science technology innovation by Japan Science and Technology Agency)

Total amount: 5,000,000 JPY (Apr. 2021 – Mar. 2023)

(Research budget: 1,400,000 JPY, Fellowship: 3,600,000 JPY)

2. Tobitate! (Leap for Tomorrow) Scholarship for Oversea Activity (by Ministry of Education, Culture, Sports, Science and Technology)

Total amount: 1,370,000 JPY (Jun. 2022 – Mar. 2023)

3. Research Fellowships for Young Scientists [DC2] (by Japan Society for the Promotion of Science)

Total amount: 7,500,000 JPY (Apr. 2023 – Now)

(Research budget: 2,000,000 JPY, Fellowship: 4,800,000 JPY)

Awards

1. Honorable mention, 12th Japan Science & Engineering Challenge, 2014, Japan
2. Encouragement Award, Chemical Engineering Society, 17th Student conference, 2015.3.17, Aomori, Japan
3. Encouragement Award, Electrochemical Society of Japan, 85th Spring meeting, 2018.3.28, Tokyo, Japan
4. Best Oral Presentation Award, Smart System Engineering 2019 (Smasys2019), 2019.10.11, Yamagata University Yamagata Japan
5. Best Poster Award, 2019 Nanjing University -Yamagata University Students Workshop, 2019.10.28, Nanjing University Nanjing China
6. Best Poster Award, 32nd Young Researchers Meeting, The Electrochemical Society of Japan Tohoku

Branch, 2019.12.16, Yamagata, Japan

7. Best Oral Presentation Award, Joint Symposium of The Electrochemical Society of Japan Tohoku Branch and Tokai Branch, 2021.11.23, Online, Japan
8. Best Student Oral Presentation Award, The 89th ECSJ Spring Meeting, 2022.3.17, Online, Japan
9. Best Poster Presentation Award, European-Material Research Society 2022 Fall Meeting, 2022.9.22, Warszawa, Poland
10. Best Oral Presentation Award, 36th Young Researchers Meeting, The Electrochemical Society of Japan Tohoku Branch, 2023.11.13, Miyagi, Japan

Reference

Professor Tsukasa Yoshida (my current advisor)

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Yamagata University, Japan

E-mail : yoshidat@yz.yamagata-u.ac.jp