

Ching-Tien Chen, Ph.D.

Urbana 61801, USA | Phone: +1-217-402-1910 | Email: cct@illinois.edu

EDUCATION

Ph.D. in Chemical System Engineering, The University of Tokyo, Japan 09/2017 – 09/2020

- Advisor: Dr. Tatsuya Okubo and Dr. Toru Wakihara
 - Dissertation: Critical factors for regulating nucleation and crystal growth of zeolites
 - Created an unconventional “intermediate stirring” method which helped reveal the nucleation process of mordenite in a dense hydrogel system containing large (ca. 10 μm) amorphous particles
 - Constructed an ultrasonication device for hydrothermal synthesis with controllable temperature and identified the physicochemical effects of ultrasonic waves on the crystallization of ZSM-5
 - Revealed a formation pathway of zeolitic structural building units that facilitates the nucleation of zeolite X
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M.S. in Chemical Engineering, National Taiwan University, Taiwan 09/2013 – 07/2015

- Advisor: Dr. Kevin C.-W. Wu
 - GPA: 3.93/4.00
 - Thesis: H_2O_2 -assisted liquid phase oxidation of 5-HMF in aqueous system
 - Designed a semi-batch reactor and engineered the production of FDCA from 5-HMF using hydrogen peroxide as oxidant and activated carbon-supported Ru metal as catalyst
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B.S. in Chemical Engineering, National Taiwan University, Taiwan 09/2009 – 07/2013

- GPA: 3.85/4.00
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RELATED PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate, University of Illinois at Urbana-Champaign, USA 11/2021 – Present

- Employer: Dr. David W. Flaherty
 - Study ethylene epoxidation mechanism over silver catalysts with in operando SERS and mass spectrometry
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Postdoctoral Research Associate, National Central University, Taiwan 04/2021 – 10/2021

- Employer: Dr. Fa-Kuen Shieh
 - Collaborate with Dr. Kevin C.-W. Wu and conduct research in National Taiwan University
 - Assist in the synthesis and characterizations of porous materials
 - Prepare proposals for research grants and write scientific papers
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Postdoctoral Research Associate, The University of Tokyo, Japan 10/2020 – 03/2021

- Employer: Dr. Toru Wakihara
 - Design materials for efficient removal of pollutants in water and air
 - Conduct research on the **reaction engineering of the continuous synthesis of nano-sized zeolites**
 - Perform synchrotron X-ray experiments at **SPring-8** (the largest synchrotron radiation facility in Japan)
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Short-Term Exchange, Catalysis Research Center (CRC), Hokkaido University, Japan 07/2014 – 09/2014

- Advisor: Dr. Atsushi Fukuoka
 - Designed ZIF-67-derived cobalt-containing carbon catalyst for glucose oxidation
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Internship (with Stipend), National Institute for Materials Science (NIMS), Japan 07/2013 – 08/2013

- Advisor: Dr. Yusuke Yamauchi
 - Achieved the synthesis of mesoporous titania films and nanoparticles
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Undergraduate Research, National Taiwan University, Taiwan 07/2011 – 07/2013

- Advisor: Dr. Kevin C.-W. Wu
- **Tailored silica and carbon materials with desired properties:** Nanosized, Magnetic, Core–Shell, Mesoporous, Acid/Base-Grafted, and Enzyme-Immobilized
- **Developed multiple catalytic reaction systems:** Conversion of cellulose/glucose/fructose/5-HMF and Biodiesel production from microalgae/soybean oil

PUBLICATIONS

- Ren-Xuan Yang, Kalsoom Jan, **Ching-Tien Chen**, Wan-Ting Chen, and Kevin C-W Wu “Thermochemical Conversion of Plastic Waste into Fuels, Chemicals, and Value-Added Materials: A Critical Review and Outlooks”, **ChemSusChem** 15, e202200171 (2022).
- Pei-Hsiang Hsu, Chien-Chun Chang, Tsu-Hao Wang, Phuc Khanh Lam, Ming-Yu Wei, **Ching-Tien Chen**, Chin-Yu Chen, Lien-Yang Chou, and Fa-Kuen Shieh “Rapid Fabrication of Biocomposites by Encapsulating Enzymes into Zn-MOF-74 via a Mild Water-Based Approach”, **ACS Appl. Mater. Interfaces** 13, 52014-52022 (2021).
- Babasaheb M. Matsagar, Hsiang-L. Sung, Jyun-Yi Yeh, **Ching-Tien Chen**, and Kevin C.-W. Wu “One-Step Hydrogenolysis of 5-Hydroxymethylfurfural to 1,2,6-Hexanetriol using a Pt@Mil-53-Derived Pt@Al₂O₃ Catalyst and NaBH₄ in Aqueous Media”, **Sustain. Energy Fuels** 5, 4087-4094 (2021).
- **Ching-Tien Chen**, Kenta Iyoki, Peidong Hu, Sohei Sukenaga, Mariko Ando, Hiroyuki Shibata, Koji Ohara, Toru Wakihara, and Tatsuya Okubo “Reaction Kinetics-Regulated Formation of Short-Range Order in an Amorphous Matrix During Zeolite Crystallization”, **J. Am. Chem. Soc.** 143, 10986-10997 (2021).
- Keita Yamashita, Zhendong Liu, Kenta Iyoki, **Ching-Tien Chen**, Shoko Miyagi, Yutaka Yanaba, Yusuke Yamauchi, Tatsuya Okubo, and Toru Wakihara “Synthetic and Natural MOR Zeolites as High-Capacity Adsorbents for the Removal of Nitrous Oxide”, **ChemComm** 57, 1312-1315 (2021).
- **Ching-Tien Chen**, Kenta Iyoki, Yasuo Yonezawa, Tatsuya Okubo, and Toru Wakihara “Understanding the Nucleation and Crystal Growth of Zeolites: A Case Study on the Crystallization of ZSM-5 from a Hydrogel System Under Ultrasonication.” **J. Phys. Chem. C** 124, 11516-11524 (2020).
- **Ching-Tien Chen**, Kenta Iyoki, Hiroki Yamada, Sohei Sukenaga, Mariko Ando, Hiroyuki Shibata, Koji Ohara, Toru Wakihara, and Tatsuya Okubo “Zeolite Crystallization Triggered by Intermediate Stirring.” **J. Phys. Chem. C** 123, 20304-20313 (2019).
- **Ching-Tien Chen**, Chi Van Nguyen, Zheng-Yen Wang, Yoshio Bando, Yusuke Yamauchi, Manar Tareq Saleh Bazziz, Amanullah Fatehmulla, W. Aslam Farooq, Takuya Yoshikawa, Takao Masuda, and Kevin C.-W. Wu “Hydrogen Peroxide Assisted Selective Oxidation of 5-Hydroxymethylfurfural in Water under Mild Conditions” **ChemCatChem** 10, 361-365 (2018).
- **Ching-Tien Chen**, Saikat Dutta, Zheng-Yen Wang, Jeffrey E. Chen, Tansir Ahamad, Saad M. Alshehri, Yusuke Yamauchi, Yi-Fa Lee, and Kevin C.-W. Wu “A Unique Approach of Applying Magnetic Nanoparticles Attached Commercial Lipase Acrylic Resin for Biodiesel Production.” **Catal. Today** 278, 330-334 (2016).
- Ya-Dong Chiang, Saikat Dutta, **Ching-Tien Chen**, Yu-Tzu Huang, Kuen-Song Lin, Jeffrey C.-S. Wu, Norihiro Suzuki, Yusuke Yamauchi, and Kevin C.-W. Wu “Functionalized Fe₃O₄@Silica Core-Shell Nanoparticles as Microalgae Harvester and Catalyst for Biodiesel Production” **ChemSusChem** 8, 789-794 (2015).
- Yi-Chun Lee, **Ching-Tien Chen**, Yu-Ting Chiu, and Kevin C.-W. Wu “An Effective Cellulose-to-Glucose-to-Fructose Conversion Sequence Using Enzyme Immobilized Fe₃O₄-Loaded Mesoporous Silica Nanoparticles as Recyclable Biocatalysts.” **ChemCatChem** 5, 2153-2157 (2013).

SKILLS

Language Mandarin, English, Japanese

Research

- **Structure analysis:** Synchrotron X-ray pair distribution function analysis, XRD, NMR
- **Composition analysis:** ICP-AES, TGA
- **Microscopy:** TEM, SEM
- **Spectroscopy:** FT-IR, UV-Vis, Raman
- **Chromatography:** GC, GC-MS, HPLC
- **Others:** Gas sorption, XPS, DLS, Zeta potential analysis

Software Aspen Plus, COMSOL, VESTA, Adobe Illustrator, ChemDraw, AutoCAD

HONORS & AWARDS

Grants	▪ Doctoral Student Special Incentives Program (SEUT-RA)	10/2018 – 09/2020
	The University of Tokyo, Japan	
	▪ Japan-Taiwan Exchange Association Scholarship	09/2017 – 08/2020
	Japan-Taiwan Exchange Association, Japan	
	▪ Research Grant for University Students	07/2012
	Ministry of Science and Technology (MOST), Taiwan	
	Title: Synthesis of mesoporous carbon nanoparticles (MCNs) exhibiting sulfonic acids ($-\text{SO}_3\text{H}$) for fructose-to-5-HMF conversion in aqueous phase	
Prizes	▪ (Poster) Grand Prize Award	11/2018
	13 th Korea-Japan Symposium on Materials and Interfaces (KJSMI), Busan, Korea	
	Title: Inducing the crystallization of mordenite by an intermediate stirring method	
	▪ (Poster) Silver Medal Award	06/2016
	The International Symposium on Catalytic Conversions of Biomass (ISCCB), Taipei, Taiwan	
	Title: H_2O_2 -assisted liquid phase oxidation of 5-HMF in aqueous system	
	▪ (Poster) Excellent Work	12/2014
	The 61 st Annual Meeting of the Taiwan Institute of Chemical Engineers, Taoyuan, Taiwan	
	Title: Novel synthesis of 2,5-dimethylfuran under ambient conditions utilizing ZIF-67 derived bifunctional carbon supported Pd and Co with aqueous hydrogen source	
	▪ (Poster) Excellent Work	11/2013
	The 60 th Annual Meeting of the Taiwan Institute of Chemical Engineers, Taipei, Taiwan	
	Title: A simple method to attach magnetic particles on commercial lipase acrylic resin from <i>candida antarctica</i> and its application toward the transesterification reaction of soybean oil	

OTHER CONFERENCE PRESENTATIONS

▪ (Oral)	The 36 th Annual Meeting of the Japan Zeolite Association, Online, Japan	11/2020
▪ (Oral)	The 33 th Fall Meeting of the Ceramic Society of Japan, Online, Japan	09/2020
▪ (Oral × 2)	The 35 th Annual Meeting of the Japan Zeolite Association, Tokyo, Japan	12/2019
▪ (Poster)	International Symposium on Porous Material, Tokyo, Japan	11/2019
▪ (Oral)	The 18 th Asian Pacific Confederation of Chemical Engineering Congress (APCChE), Sapporo, Japan	09/2019
▪ (Poster)	The 8 th Green Sustainable Chemistry Symposium (JACI/GSC), Tokyo, Japan	06/2019
▪ (Oral)	The 2 nd NTU-UTokyo Joint Symposium of Innovation on Emergent Materials, Taipei, Taiwan	11/2016
▪ (Poster)	International Conference on Nanospace Materials (ICNM), Taipei, Taiwan	06/2015
▪ (Poster)	The 15 th Japan-Taiwan Joint Symposium on Catalysis, Kaohsiung, Taiwan	04/2015
▪ (Oral)	International Conference on Nanocatalysts and Nanomaterials for Green Technologies, Taipei, Taiwan	11/2014
▪ (Poster & Short Oral)	Japan-Taiwan Joint Workshop on Nanospace Materials, Fukuoka, Japan	03/2014
▪ (Poster)	The 6 th Asia-Pacific Congress on Catalysis (APCAT-6), Taipei, Taiwan	10/2013