

Selected Publications

Y. Yuan, S. Garg and J.G. Chen*, “Reactor engineering for Converting CO₂ to solid carbon”, *Nature Chemical Engineering*, 3 (2026) 82.

Y. Yuan, T. Mou, S. Hwang, W.N. Porter, P. Liu* and J.G. Chen*, “Controlling Reaction Pathways of Ethylene Hydroformylation using Isolated Bimetallic Rhodium-Cobalt Sites”, *Journal of the American Chemical Society*, 47 (2025) 12185.

Z. Xie, E. Huang, K.K. Turaczy, S. Garg, S. Hwang, P.R. Kasala, P. Liu* and J.G. Chen*, “Biogas sequestration to carbon nanofibers via tandem catalytic strategies”, *Nature Chemical Engineering*, 2 (2025) 118.

X. Han, T. Mou, S. Kang, A. Islam, X. Zhao, K. Sasaki, J.A. Rodriguez, Q. Chang*, P. Liu* and J.G. Chen*, "Enhancing Acidic Oxygen Evolution Activity by Controlling Oxidation State of Iridium", *Angewandte Chemie International Edition*, 64 (2025) e202507468.

Q. Wang, S.-F. Hung, K. Lao, X. Huang, F. Li, H.B. Tao*, H.B. Yang, W. Liu, W. Wang, L. Zhang, J. Zhang, Y. Cheng, Y. Liu, J. Chen, Y. Xu, C. Su, J.G. Chen* and B. Liu*, “Breaking the linear-scaling limit in multi-electron-transfer catalysis through intermediate spillover”, *Nature Catalysis*, 8 (2025) 378.

W. Zhang, B. Yang, B.A. Jackson, J. Zhao, H. Shi, D.M. Camaioni, S. Kim, H. Wang, J. Szanyi, M. Lee, J.G. Chen and J.A. Lercher*, “Integrated low-temperature PVC and polyolefin upgrading”, *Science*, 390 (2025) 88.

S. Garg, Z. Xie* and J.G. Chen*, “Tandem Reactors and Reactions for CO₂ Conversion”, *Nature Chemical Engineering*, 1 (2024) 139.

Z. Xie, E. Huang, S. Garg, S. Hwang, P. Liu* and J.G. Chen*, “CO₂ fixation into carbon nanofibers using electrochemical-thermochemical tandem catalysis”, *Nature Catalysis*, 7 (2024) 98.

X. Han, T. Mou, A. Islam, S. Kang, Q. Chang, Z. Xie, X. Zhao, K. Sasaki, J.A. Rodriguez, P. Liu*, and J.G. Chen*, “Theoretical Prediction and Experimental Verification of IrO_x Supported on Titanium Nitride for Acidic Oxygen Evolution Reaction”, *Journal of the American Chemical Society*, 146 (2024) 16499.

Y. Yuan, E. Huang, S. Hwang, P. Liu and J.G. Chen*, “Converting Carbon Dioxide into Carbon Nanotubes by Reacting with Ethane”, *Angewandte Chemie International Edition*, 63 (2024) e202404047.

L. Jiang, K. Li*, W.N. Porter, H. Wang, G. Li* and J.G. Chen*, “Role of H₂O in catalytic conversion of C₁ molecules”, *Journal of the American Chemical Society*, 146 (2024) 2857.

- A.N. Biswas, L.R. Winter, Z. Xie and J.G. Chen*, “Utilizing CO₂ as a Reactant for C₃ Oxygenate Production via Tandem Reactions”, *JACS Au*, 3 (2023) 293.
- P. Zhai, Z. Xie, E. Huang, D.R. Aireddy, H. Yu, D.A. Cullen, P. Liu*, J.G. Chen* and K. Ding*, “CO₂-Mediated Oxidative Dehydrogenation of Propane Enabled by Pt-Based Bimetallic Catalysts”, *Chem*, 9 (2023) 3268.
- Q. Chang, Y. Liu, J.-H. Lee, D. Ologunagba, S. Hwang, Z. Xie, S. Kattel*, J.H. Lee* and J.G. Chen*, “Metal-coordinated Phthalocyanines as Platform Molecules for Understanding Isolated Metal Sites in Electrochemical Reduction of CO₂”, *Journal of the American Chemical Society*, 144 (2022) 16131.
- A.N. Biswas, Z. Xie, R. Xia, S. Overa, F. Jiao* and J.G. Chen*, “Tandem Electrocatalytic-Thermocatalytic Reaction Scheme for CO₂ Conversion to C₃ Oxygenates”, *ACS Energy Letters*, 7 (2022) 2904.
- I. Ro, J. Qi, S. Lee, M. Xu, X. Yan, Z. Xie, G. Zakem, A. Morales, J.G. Chen, X. Pan, D.G. Vlachos, S. Caratzoulas and P. Christopher*, “Bifunctional hydroformylation on heterogeneous Rh-WO_x pair site catalysts”, *Nature*, 609 (2022) 287.
- Z. Xie, X. Wang, X. Chen, P. Liu* and J.G. Chen*, “General Descriptors for CO₂-Assisted Selective C-H/C-C Bond Scission in Ethane”, *Journal of the American Chemical Society*, 114 (2022) 4186.
- A.N. Biswas, L.R. Winter, B. Loenders, Z. Xie, A. Bogaerts* and J.G. Chen*, “Oxygenate Production from Plasma-Activated Reaction of CO₂ and Ethane”, *ACS Energy Letters*, 7 (2022) 236.
- L.R. Winter and J.G. Chen*, “N₂ Fixation by Plasma-Activated Processes”, *Joule*, 5 (2021) 300.
- D. Wang, Z. Xie, M.D. Porosoff* and J.G. Chen*, “Recent advances in carbon dioxide hydrogenation to produce olefins and aromatics”, *Chem*, 7 (2021) 2277.
- R.M. Bullock*, J.G. Chen*, L. Gagliardi*, P.J. Chirik, O.K. Farha, C.H. Hendon, C.W. Jones, J.A. Keith, J. Klosin, S. D. Minter, R.H. Morris, A.T. Radosevich, T.B. Rauchfuss, N.A. Strotman, A. Vojvodic, T.R. Ward, J.Y. Yang, and Y. Surendranath*, “Using nature’s blueprint to expand catalysis with Earth-abundant metals”, *Science*, 369 (2020) 786.
- Y. Liu, D. Tian, A.N. Biswas, Z. Xie, S. Hwang, J.H. Lee, H. Meng and J.G. Chen*, “Transition Metal Nitrides as Promising Catalyst Supports for Tuning CO/H₂ Syngas Production from Electrochemical CO₂ Reduction”, *Angewandte Chemie International Edition*, 59 (2020) 11345.
- Z. Xie, Y. Xu, M. Xie, X. Chen, J.H. Lee, E. Stavitski, S. Kattel and J.G. Chen*, “Reactions of CO₂ and Ethane Enable CO Bond Insertion for Production of C₃ Oxygenates”, *Nature Communications*, 11 (2020) 1887.

Q. He, D. Liu, J.H. Lee, Y. Liu, Z. Xie, S. Hwang, S. Kattel*, L. Song*, and J.G. Chen*, “Electrochemical Conversion of CO₂ to Syngas with Controllable CO/H₂ Ratios over Co and Ni Single-Atom Catalysts”, *Angewandte Chemie International Edition*, 59 (2020) 3033.

E. Gomez, X. Nie, J.H. Lee, Z. Xie and J.G. Chen*, “Tandem reactions of CO₂ reduction and ethane aromatization”, *Journal of the American Chemical Society*, 141 (2019) 17771.

J.H. Lee, S. Kattel, Z. Jiang, Z. Xie, S. Yao, B.M. Tackett, W. Xu, N.S. Marinkovic, and J.G. Chen*, “Tuning the Activity and Selectivity of Electroreduction of CO₂ to Synthesis Gas using Bimetallic Catalysts”, *Nature Communications*, 10 (2019) 3724.

B.M. Tackett, E. Gomez and J.G. Chen*, “Net reduction of CO₂ via its thermocatalytic and electrocatalytic transformation reactions in standard and hybrid processes”, *Nature Catalysis*, 2 (2019) 381.

J. Wang, S. Kattel, C.J. Hawxhurst, J.H. Lee, B.M. Tackett, K. Chang, N. Rui, C.-J. Liu* and J.G. Chen*, “Enhancing Activity and Reducing Cost for Electrochemical Reduction of CO₂ by Supporting Palladium on Metal Carbides”, *Angewandte Chemie International Edition*, 58 (2019) 6271.

E. Gomez, B. Yan, S. Kattel and J.G. Chen*, “Carbon dioxide reduction in tandem with light alkane dehydrogenation”, *Nature Reviews Chemistry*, 3 (2019) 638.

W. Wan, S.C. Ammal, Z. Lin, K.-E. You, A. Heyden* and J.G. Chen*, “Controlling reaction pathways of selective C-O bond cleavage of glycerol”, *Nature Communications*, 9 (2018) 4612.

B. Yan, S. Yao, S. Kattel, Q. Wu, Z. Xie, E. Gomez, P. Liu, D. Su and J.G. Chen*, “Active sites for tandem reactions of CO₂ reduction and ethane dehydrogenation”, *Proceedings of the National Academy of Sciences of United States*, 115 (2018) 8278.

E. Gomez, S. Kattel, B. Yan, S. Yao, P. Liu* and J.G. Chen*, “Combining CO₂ Reduction with Propane Oxidative Dehydrogenation over Bimetallic Catalysts”, *Nature Communications*, 9 (2018) 1398.

J.G. Chen*, R.M. Crooks*, L.C. Seefeldt*, K.L. Bren, R.M. Bullock, M.Y. Darensbourg, P.L. Holland, B. Hoffman, M.J. Janik, A.K. Jones, M.G. Kanatzidis, P. King, K.M. Lancaster, S.V. Lymar, P. Pfromm, W.F. Schneider, R.R. Schrock, “Beyond Fossil-Fuel-Driven Nitrogen Transformations”, *Science*, 360 (2018) 873.