

Curriculum Vitae

Matthew W. Kanan

EDUCATION

2005: Ph.D. Organic Chemistry, Harvard University

2000: B.A. Chemistry *Summa Cum Laude*, Rice University

APPOINTMENTS

2024-present: Professor of Chemistry, Stanford University

2023-present: Fellow, Canadian Institute for Advanced Research

2023-present: Advisor, Dioxcycle, SAS

2019-present: Director, TomKat Center for Sustainable Energy, Stanford University

2019-present: Co-Founder, Board Member, Chief Scientific Advisor, ReSource Chemical

2018-present: Senior Fellow, Precourt Institute for Energy

2017-present: Co-Founder and Board Member, Aza Technology

2017-2023: Associate Professor of Chemistry, Stanford University

2009-2017: Assistant Professor of Chemistry, Stanford University

2005-2009: NIH Postdoctoral Research Fellow, Inorganic Chemistry, MIT

SELECTED PUBLICATIONS (full list available in [Google Scholar profile](#))

Thermal Ca²⁺/Mg²⁺ Exchange Reactions to Transform Abundant Silicates into Alkaline Materials for Carbon Dioxide Removal. Chen, Kanan* *ChemRxiv*: 10.26434/chemrxiv-2023-wwv9-v2, **2024**.

Membrane-Free Electrochemical Production of Acid and Base Solutions Capable of Processing Ultramafic Rocks. Charnay, Chen, Agarwal, Misleh, Wright, Sauve, Toh, Surendranath*, Kanan* *ChemRxiv*: 10.26434/chemrxiv-2023-5tndz, **2023**.

A Semi-Crystalline Furanic Polyamide Made from Renewable Feedstocks. Woroch, Cox, Kanan* *J. Am. Chem. Soc.* **2023**, *145*, 697-705.

Carbonate-Catalyzed Reverse Water Gas-Shift to Produce Gas Fermentation Feedstocks for Renewable Liquid Fuel Synthesis. Li, Frankhouser, Kanan* *Cell Reports Physical Science*, **2022**, *3*, 101021.

A Framework for Automated Structure Elucidation from Routine NMR Spectra. Huang, Chen, Woroch, Markland*, Kanan* *Chem. Sci.* **2021**, *12*, 15329-15338.

Microstructural Origin of Locally Enhanced CO₂ Electroreduction Activity on Gold. Mariano, Kang, Wahab, McPherson, Rabinowitz, Unwin*, Kanan* *Nat. Mater.*, **2021**, *20*, 1000-1006.

The Future of Low-Temperature Carbon Dioxide Electrolysis Depends on Solving One Basic Problem. Rabinowitz, Kanan* *Nat. Commun.*, **2020**, doi: 10.1038/s41467-020-19135-8.

Point-of-Care Analysis of Blood Ammonia with a Gas-Phase Sensor. Veltman, Tsai, Gomez-Ospina, Kanan*, Chu* *ACS Sensors*, **2020**, *5*, 2415-2421.

A Closed Cycle for Esterifying Aromatic Hydrocarbons with CO₂ and Alcohol. Xiao, Chant, Frankhouser, Chen, Yau, Washton, Kanan* *Nat. Chem.*, **2019**, *11*, 940-947.

Carbon Monoxide Gas Diffusion Electrolysis that Produces Concentrated C₂ Products with High Single-Pass Conversion. Ripatti, Veltman*, Kanan* *Joule*, **2019**, *3*, 240–256.

Selective Increase in CO₂ Electroreduction Activity at Grain Boundary Surface Terminations. Mariano, McKelvey, White, Kanan* *Science* **2017**, *358*, 1187–1192.

Carbon Dioxide Utilization via Carbonate-Promoted C–H Carboxylation. Banerjee, Dick, Yoshino, Kanan* *Nature* **2016**, *531*, 215–219.

Electroreduction of Carbon Monoxide to Liquid Fuel on Oxide-Derived Nanocrystalline Copper. Li, Ciston, Kanan* *Nature* **2014**, *508*, 504–507.

ISSUED PATENTS

Electrochemical Cell for the Production of Concentrated Liquid Product Streams from the Reduction of CO and/or CO₂. Kanan, Ripatti, Veltman, US Patent 11,479,871 (2022).

Carbonate-Promoted Carboxylation Reactions for the Synthesis of Valuable Organic Compounds. Kanan, Banerjee, US Patent 10,160,740 (2018).

Rapid Small-Volume Detection of Blood Ammonia. Veltman, Tsai, Kanan, Chu, US Patent 9,625,443 (2017).

Catalysts for Low Temperature Electrolytic CO₂ or CO Reduction. Li, Chen, Kanan, US Patent 9,255,355 (2016).

PATENT APPLICATIONS

Thermal Process to Transform Silicate Minerals into Alkaline Solids for Carbon Removal. Kanan, Chen, US Patent Appl. No. 63/518,038 (2023).

Electrochemical Systems for Generating Acidic and Basic Solutions. Kanan, Agarwal, Charnay, Wright, Misleh, PCT/US24/28374 (2023).

Transforming Silicate Containing Materials into Reactive Materials for CO₂ Capture and Other Applications. Surendranath, Toh, Kanan, Agarwal, Charnay, Chen, Rabinowitz, US Patent Appl. No. 63/367,222 (2022).

Dispersed Carbonate Catalysts for the Reverse Water-Gas Shift Reaction. Kanan, Frankhouser, Li, Intl Pat. Appl. PCT/US22/025361 (2022).

SERVICE

2022-present: Member of the Advisory Board for Stanford Energy Postdoctoral Fellowships.

2022-present: Member of the Council for the Stanford Sustainability Accelerator.

2022-present: External Advisory Board Member, US DOE CO₂ Reduction and Upgrading (CRU) Consortium.

2019-2022: Review panelist for six US DOE funding programs: SETO Concentrating Solar-Thermal Power, EERE Scale-Up and Conversion, EERE/BETO CO₂ to Fuels, CO₂ Utilization, National Lab CO₂ Feasibility Study, and Electro-Microbial CO₂ Conversion Programs.

2017-2018: Member of the National Academy of Sciences' Committee on Developing a Research Agenda for the Utilization of Gaseous Carbon Waste Streams. *Gaseous Carbon Waste Streams Utilization: Status and Research Needs* published October 18, 2018.