

Matthew W. Kanan

Stanford University, 337 Campus Drive, Stanford, CA 94305. mkanan@stanford.edu

EDUCATION

2005: Ph.D. Organic Chemistry, Harvard University

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

APPOINTMENTS

2024-present: Professor, Department of Chemistry, Stanford University

2017-2023: Associate Professor, Department of Chemistry, Stanford University

2009-2017: Assistant Professor, Department of Chemistry, Stanford University

2024-present: Co-Founder, Mafix, Inc.

2023-present: Fellow, Canadian Institute for Advanced Research, Accelerated Decarbonization Program

2018-present: Senior Fellow, Precourt Institute for Energy, Stanford University

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

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

2019-2025: Director, TomKat Center for Sustainable Energy, Stanford University

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

SELECTED PUBLICATIONS (full list on Google Scholar [profile](#). h-index: 43; >23,000 citations)

1. Membrane-Free Electrochemical Production of Acid and Base Solutions Capable of Processing Ultramafic Rocs. Charnay, Chen, Misleh, Wright, Agarwal, Sauve, Toh, Surendranath* & Kanan* *Nat. Commun.* **2025**, *16*, 9751.
2. Intermediate-Temperature Reverse Water-Gas Shift Under Process-Relevant Conditions Catalyzed by Dispersed Alkali Carbonates. Tamakuwala, Kennedy, Li, Mutz, Boller, Bare & Kanan* *JACS Au* **2025**, *5*, 1083.
3. Thermal Ca²⁺/Mg²⁺ Exchange Reactions to Synthesize CO₂ Removal Materials. Chen & Kanan* *Nature* **2025**, *638*, 972-979.
4. Toughening Poly(lactic acid) Without Compromise – Statistical Copolymerization with a Bio-Derived Bicyclic Lactone. Sanchez, Woroch, Dumas, Waymouth* & Kanan* *J. Am. Chem. Soc.* **2025**, *147*, 5212-5219.
5. Accurate and Efficient Structure Elucidation from Routine One-Dimensional NMR Spectra Using Multitask Machine Learning. Hu, Chen, Rotskoff*, Kanan* & Markland* *ACS Cent. Sci.* **2024**, *10*, 2162.
6. Microstructural Origin of Locally Enhanced CO₂ Electroreduction Activity on Gold. Mariano, Kang, Wahab, McPherson, Rabinowitz, Unwin*, Kanan* *Nat. Mater.* **2021**, *20*, 1000–1006.
7. Rapid Prototyping of Lab-Scale Electrolysis Cells Using Stereolithography and Electroless Plating. Wright, Charnay, Rabinowitz, Mariano & Kanan* *Device* **2023**, *1*, 10049.
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.
9. Selective Increase in CO₂ Electroreduction Activity at Grain-Boundary Surface Terminations. Mariano, McKelvey, White & Kanan* *Science* **2017**, *358*, 1187-1192.
10. Carbon Dioxide Utilization via Carbonate-Promoted C–H Carboxylation. Banerjee, Dick, Yoshino, Kanan* *Nature* **2016**, *531*, 215–219.

SELECTED PATENTS AND PATENT APPLICATIONS (5 issued, 10 pending)

1. Carbonate-Promoted Carboxylation at High Rates. Kanan, Banerjee, Frankhouser. US 12,358,882 B2 (2025).
2. Degradable Polyesters With Improved Thermomechanical Properties. Woroch, Sanchez, Dumas, Waymouth, Kanan. PCT/US2025/039334 (2025).
3. Thermal Oxide-Silicate Conversion Processes. Kanan, Chen, Marcus. PCT/US2024/040963 (2024).
4. Electrochemical System for Generating Acidic and Basic Solutions. Kanan, Agarwal, Charnay, Wright, Misleh. PCT/US2024/028374 (2024).
5. Dispersed Carbonate Catalysts for the Reverse Water-Gas Shift Reaction. Kanan, Frankhouser, Li. PCT/US2022/025361 (2022).
6. Rapid Small-Volume Detection of Blood Ammonia. Veltman, Tsai, Kanan, Chu, US 9,625,443 (2017).

SYNERGISTIC ACTIVITIES

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

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

2019-2024: Review panelist for six US DOE funding opportunities from EERE and SETO

2017-2025: Director of the Stanford Chemistry Summer Undergraduate Research Program