

*Curriculum Vitae*

**Matthew W. Kanan**

Assistant Professor of Chemistry  
Stanford University  
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**EDUCATION**

2000-2005: Harvard University  
Ph.D. Organic Chemistry  
*National Science Foundation Graduate Research Fellow*  
DNA-Templated Synthesis and Reaction Discovery  
1996-2000: Rice University  
B.A. Chemistry, *Summa Cum Laude, Phi Beta Kappa*

**PROFESSIONAL EXPERIENCE**

2009–present: Stanford University  
Assistant Professor of Chemistry  
2005-2009: Massachusetts Institute of Technology  
*National Institutes of Health Postdoctoral Research Fellow*  
Water-Oxidation Catalysis

**HONORS**

2016: Camille and Henry Dreyfus Environmental Mentor  
2015: Selected as one of first annual *Chemistry & Engineering News* Talented 12  
2014: Camille Dreyfus Teacher-Scholar Award  
2013: Hellman Faculty Scholar Award  
2012: Camille and Henry Dreyfus Environmental Mentor  
2010: Thieme Journal Award  
2009: Eli Lilly New Faculty Award

**PUBLICATIONS**

\* indicates corresponding author

**Independent**

17. “Bragg Coherent Diffractive Imaging of Single-Grain Defect Dynamics in Polycrystalline Films” Yau A, Cha W, Kanan MW, Stephenson\* GB, Ulvestad\* A **2017**, *In Revision*.
16. “Electrostatic Control of Regioselectivity in Au(I)-Catalyzed Hydroarylation” Lau VM, Pfalzgraff WC, Markland TE, Kanan\* MW *J. Am. Chem. Soc.* **2017**, *just accepted*.

15. “Molecular Catalysis at Polarized Interfaces Created by Ferroelectric BaTiO<sub>3</sub>” Beh ES, Basun SA, Feng X, Idehenre IU, Evans DR, Kanan\* MW *Chem. Sci.* **2017**, *Advance Article*.
14. “A Direct Grain Boundary–Activity Correlation for CO Electroreduction on Cu Nanoparticles” Feng X, Jiang K, Fan S, Kanan\* MW *ACS Cent. Sci.* **2016**, *2*, 169–174.
13. “Carbon Dioxide Utilization via Carbonate-Promoted C–H Carboxylation” Banerjee A, Dick GR, Yoshino T, Kanan\* MW *Nature* **2016**, *531*, 215–219.
12. “Probing the Active Surface Sites for CO Reduction on Oxide-Derived Copper Electrocatalysts” Verdaguer-Casadevall A, Li CW, Johansson TP, Scott SB, McKeown JT, Kumar M, Stephens IEL, Kanan\* MW, Chorkendorff\* I *J. Am. Chem. Soc.* **2015**, *137*, 9808–9811.
11. “Grain Boundary–Dependent CO<sub>2</sub> Reduction Activity” Feng X, Jiang K, Fan S, Kanan\* MW *J. Am. Chem. Soc.* **2015**, *137*, 4606–4609.
10. “Pd-Catalyzed Electrochemical Conversion of Carbon Dioxide to Formate: High Mass Activity at Minimal Overpotential and Identification of the Deactivation Pathway” Min X, Kanan\* MW *J. Am. Chem. Soc.* **2015**, *137*, 4701–4708.
9. “Controlling H<sup>+</sup> vs CO<sub>2</sub> Reduction Selectivity on Pb Electrodes” Lee CH, Kanan\* MW *ACS Catal.* **2015**, *5*, 465–469.
8. “Electrostatic Control of Regioselectivity via Ion Pairing in a Au(I)-Catalyzed Rearrangement” Lau VM, Gorin CF, Kanan\* MW *Chem. Sci.* **2014**, *5*, 4975–4979.
7. “Alkaline O<sub>2</sub> Reduction on Oxide-Derived Au: High Activity and 4e<sup>-</sup> Selectivity without (100) Facets” Min X, Chen Y, Kanan\* MW *Phys. Chem. Chem. Phys.* **2014** *16*, 13601–13604.
6. “Electroreduction of Carbon Monoxide to Liquid Fuel on Oxide-Derived Nanocrystalline Copper” Li CW, Ciston J, Kanan\* MW *Nature* **2014**, *508*, 504–507.
5. “Interfacial Electric Field Effects on a Carbene Reaction Catalyzed by Rh Porphyrins” Gorin CF, Beh ES, Bui QM, Dick GR, Kanan\* MW *J. Am. Chem. Soc.* **2013**, *135*, 11257–11265.
4. “Aqueous CO<sub>2</sub> Reduction at Very Low Overpotential on Oxide-Derived Au Nanoparticles” Chen Y, Li CW, Kanan\* MW *J. Am. Chem. Soc.* **2012**, *134*, 19969–19972.
3. “CO<sub>2</sub> Reduction at Low Overpotential on Cu Electrodes Resulting from the Reduction of Thick Cu<sub>2</sub>O Films” Li CW, Kanan\* MW *J. Am. Chem. Soc.* **2012**, *134*, 7231–7234.
2. “Tin Oxide Dependence of the CO<sub>2</sub> Reduction Efficiency on Tin Electrodes and Enhanced Activity for Tin/Tin Oxide Thin-Film Catalysts” Chen Y, Kanan\* MW *J. Am. Chem. Soc.* **2012**, *134*, 1986–1989.
1. “An Electric Field–Induced Change in the Selectivity of a Metal Oxide–Catalyzed Epoxide Rearrangement” Gorin CF, Beh ES, Kanan\* MW *J. Am. Chem. Soc.* **2012**, *134*, 186–189.

### **Postdoctoral and Graduate Work**

10. “Mechanistic Studies of the Oxygen Evolution Reaction by a Cobalt-Phosphate Catalyst at Neutral pH” Surendranath Y, Kanan MW, Nocera\* DG *J. Am. Chem. Soc.* **2010**, *132*, 16501–16509.

9. "Structure and Valency of a Cobalt-Phosphate Water Oxidation Catalyst Determined by In Situ X-ray Spectroscopy" Kanan MW, Yano J, Surendranath Y, Dincă M, Yachandra\* VK Nocera\* DG *J. Am. Chem. Soc.* **2010**, *132*, 13692–13701.
8. "Cobalt-Phosphate Oxygen Evolving Compound" Kanan MW, Surendranath Y, Nocera\* DG *Chem. Soc. Rev.* **2009**, *38*, 109-114.
7. "In Situ Formation of an Oxygen-Evolving Catalyst in Neutral Water Containing Phosphate and Co<sup>2+</sup>" Kanan MW, Nocera\* DG *Science* **2008**, *321*, 1072-1075.
6. "Development and Initial Application of a Hybridization-Independent, DNA-Encoded Reaction Discovery System Compatible with Organic Solvents" Rozenman MM, Kanan MW, Liu\* DR *J. Am. Chem. Soc.* **2007**, *129*, 14933-14938.
5. "Synthesis of Acyclic  $\alpha,\beta$ -Unsaturated Ketones Via Pd(II)-Catalyzed Intermolecular Reaction of Alkynamides and Alkenes" Momiyama N, Kanan MW, Liu\* DR *J. Am. Chem. Soc.* **2007**, *129*, 2230-2231.
4. "Reaction Discovery Enabled by DNA-Templated Synthesis and In Vitro Selection" Kanan MW, Rozenman MM, Sakurai K, Snyder TM, Liu\* DR *Nature* **2004**, *431*, 545-549.
3. "Multi-Step Small-Molecule Synthesis Programmed by DNA Templates" Gartner ZJ, Kanan MW, Liu\* DR *J. Am. Chem. Soc.* **2002**, *124*, 10304-10306.
2. "Expanding the Reaction Scope of DNA-Templated Synthesis" Gartner ZJ, Kanan MW, Liu\* DR *Angew. Chem. Int. Ed.* **2002**, *41*, 1796-1800.
1. "Facile Synthesis of a Fluorescent Deoxycytidine Analogue Suitable for Probing the RecA Nucleoprotein Filament" Singleton\* SF, Shan F, Kanan MW, McIntosh CM, Stearman CJ, Helm JS, Webb KJ *Org. Lett.* **2001**, *3*, 3919-3922.

## ISSUED PATENTS AND PATENT APPLICATIONS

### Issued Patents

- "Catalysts for Low Temperature Electrolytic CO<sub>2</sub> or CO Reduction" Li CW, Chen Y, Kanan MW. US Patent 9,255,355 (2016).
- "Palladium-Catalyzed Carbon–Carbon Bond-Forming Reactions" Liu DR, Kanan MW, Rozenman MM. US Patent 7,851,658 (2010).
- "Evolving New Molecular Function" Liu DR, Gartner, ZJ, Kanan MW. US Patent 7,070,928 (2006).

### Patent Applications

- "Carbonate-Promoted Carboxylation Reactions for the Synthesis of Valuable Organic Compounds" Kanan MW, Banerjee A. US Patent Application 62/136,288 (2015).
- "Rapid Small-Volume Detection of Blood Ammonia" Veltman TR, Tsai C, Kanan MW, Chu G. US Patent App. 14/619,609 (2015).