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Professional Appointments

Associate Professor of Chemistry, Massachusetts Institute of Technology	07/2015 – present
Assistant Professor of Chemistry, Massachusetts Institute of Technology	07/2010 – 07/2015
Postdoctoral Associate, MIT (Advisor: Daniel G. Nocera)	08/2008 – 07/2010

Education

Ph.D. in Inorganic Chemistry (Advisor: Jeffrey R. Long)	University of California, Berkeley, May 2008
Thesis Title: Hydrogen Storage in Microporous Metal-Organic Frameworks with Exposed Metal Sites	
B.A. magna cum laude in Chemistry (Advisor: Jeffrey Schwartz)	Princeton University, June 2003

Awards and Honors

Dalton Lectureship – UC Berkeley	2016
Dream Chemistry Award (Polish Academy of Sciences)	2015
ExxonMobil ACS Solid State Chemistry Faculty Fellowship	2015
NSF CAREER Award	2015
Keith Fagnou Lectureship – University of Ottawa	2015
Thomson-Reuters Most Cited Chemists List	2014, 2015
Cottrell Scholar Award – Research Corporation for Science Advancement	2014
Alfred P. Sloan Research Fellowship	2014
Dreyfus Fellowship in Environmental Chemistry	2013
3M Non-Tenured Faculty Award	2013
Selected US (ACS) Representative for Transatlantic Frontiers of Chemistry Conference	2013
MIT Technology Review TR-35 Award	2012
DOE Young Investigator Award	2011
ICMR International Research Fellowship	2008
ITRI/Berkeley Research Center Predoctoral Fellowship, UC Berkeley	2006-2008
ICMR Travel Grant, Hydrogen Storage Symposium, Santa Barbara, CA	2006
ICYS-ICMR Travel Grant, Summer School on Nanomaterials, Tsukuba, Japan	2006
ACS Fuel Division Travel Grant, ACS Meeting, San Francisco, CA	2006
Everett S. Wallis Prize in Organic Chemistry, Princeton University	2003
First Prize, International Science Olympiad (Chemistry), Yakutsk, Russia	1998

Publications

Independent career:

- (58) Campagnol, N.; Van Assche, T. R. C.; Li, M.; Stappers, L.; **Dincă, M.**; Denayer, J. F. M.; Binnemans, K.; De Vos, D. E.; Fransaer, J. "On the Electrochemical Deposition of Metal-Organic Frameworks"
J. Mater. Chem. A **2016**, 4, in press.
- (57) Metzger, E. M.; Brozek, C. K.; Comito, R. J.; **Dincă, M.** "Selective Dimerization of Ethylene to 1-Butene with a Porous Catalyst"
ACS Central Science **2016**, 2, in press.
- (56) Yamada, M.; Soejima, T.; Tsuji, N.; Hirai, D.; **Dincă, M.**; Aoki, H. "First-Principles Design of a Half-Filled Flat Band of the Kagome Lattice in Two-Dimensional Metal-Organic Frameworks"
arXiv:1510.00164 [cond-mat.str-el], submitted.
- (55) Miner, E. M.; Fukushima, T.; Sheberla, D.; Sun, L.; Surendranath, Y.; **Dincă, M.** "Electrochemical Oxygen Reduction Catalyzed by Ni₃(HITP)₂"
Nature Commun. **2016**, 7, in press.
- (54) Wu, M.; Wang, Z.; Liu, J.; Li, W.; Fu, H.; Sun, L.; Liu, X.; Pan, M.; Weng, H.; **Dincă, M.**; Fu, L.; Li, J. "Conetronics in 2D Metal-Organic Frameworks: Double Dirac Cones, Magnetic Half Dirac Cones, and Quantum Anomalous Hall Effect"
submitted.
- (53) Akimbekov, Z.; Wu, D.; Brozek, C. K.; **Dincă, M.**; Navrotsky, A. "Thermodynamics of Solvent Interaction with the Metal Organic Framework MOF-5"
Phys. Chem. Chem. Phys. **2016**, 118, 1158-1162.
- (52) Sun, L.; Campbell, M. G.; **Dincă, M.** "Electrically Conductive Porous Metal-Organic Frameworks"
Angew. Chem. Int. Ed. **2016**, 55, in press. (Review)

- (51) Campbell, M. G.; Liu, S. F.; Swager, T. M.; **Dincă, M.** "Chemiresistive Sensor Arrays from Conductive 2D Metal-Organic Frameworks" *J. Am. Chem. Soc.* **2015**, *137*, 13780-13783.
- (50) Brozek, C. K.; Michaelis, V. K.; Ong, T.-C.; Bellarosa, L.; López, N.; Griffin, R. G.; **Dincă, M.** "Dynamic DMF binding in MOF-5 enables the formation of metastable cobalt-substituted MOF-5 analogs" *ACS Central Science* **2015**, *1*, 252-260.
- (49) Duhovic, S.; **Dincă, M.** "Synthesis and Electrical Properties of Covalent Organic Frameworks with Heavy Chalcogens" *Chem. Mater.* **2015**, *27*, 5487-5490.
- (48) Brozek, C. K.; **Dincă, M.** "Thermodynamic parameters of cation exchange in MOF-5 and MFU-4l" *Chem. Commun.* **2015**, *51*, 11780-11782.
- (47) Brozek, C. K.; Miller, J. T.; Stoian, S. A.; **Dincă, M.** "NO Disproportionation at a Mononuclear Site-isolated Fe(II) Center in Fe(II)-MOF-5" *J. Am. Chem. Soc.* **2015**, *137*, 7495-7501.
- (46) Sun, L.; Hendon, C. H.; Minier, M. A.; Walsh, A.; **Dincă, M.** "Million-Fold Electrical Conductivity Enhancement in Fe₂(DEBDC) versus Mn₂(DEBDC) (E = S, O)" *J. Am. Chem. Soc.* **2015**, *137*, 6164-6167.
- (45) Bellarosa, L.; Brozek, C. K.; Garcia-Melchor, M.; **Dincă, M.**; Lopez, N. "When the Solvent Locks the Cage: Theoretical Insight into the Transmetalation of MOF-5 Lattices and its Kinetic Limitations" *Chem. Mater.* **2015**, *27*, 3422-3429.
- (44) Li, M.; **Dincă, M.** "On the Mechanism of MOF-5 Formation under Cathodic Bias" *Chem. Mater.* **2015**, *27*, 3203-3206.
- (43) Campbell, M. G.; Sheberla, D.; Liu, S. F.; Swager, T. M.; **Dincă, M.** "Chemiresistive Sensing in Cu₃(hexaiminotriphenylene)₂, an Electrically Conductive 2D Metal-Organic Framework" *Angew. Chem. Int. Ed.* **2015**, *54*, 4349-4352.
- (42) Park, S. S.; Hontz, E. R.; Sun, L.; Van Voorhis, T.; **Dincă, M.** "Cation-Dependent Intrinsic Electrical Conductivity in Isostructural Tetrathiafulvalene-Based Microporous Metal-Organic Frameworks" *J. Am. Chem. Soc.* **2015**, *137*, 1774-1777.
- (41) Sheberla, D.; Sun, L.; Blood-Forsythe, M. A.; Er, S.; Wade, C. R.; Brozek, C. K.; Aspuru-Guzik, A.; **Dincă, M.** "High Electrical Conductivity in Ni₃(2,3,6,7,10,11-hexaiminotriphenylene)₂, a Semiconducting Metal-Organic Graphene Analogue" *J. Am. Chem. Soc.* **2014**, *136*, 8859-8862.
- (40) Brozek, C. K.; **Dincă, M.** "Cation Exchange at the Secondary Building Units of Metal-Organic Frameworks" *Chem. Soc. Rev.* **2014**, *43*, 5456-5467 (**Review**).
- (39) Brozek, C. K.; Bellarosa, L.; Soejima, T.; Clark, T. V.; López, N.; **Dincă, M.** "Solvent-Dependent Cation Exchange in Metal-Organic Frameworks" *Chem. Eur. J.* **2014**, *20*, 6871-6874.
- (38) Cozzolino, A. F.; Brozek, C. K.; Palmer, R. D.; Yano, J.; Li, M.; **Dincă, M.** "Ligand Redox Non-innocence in the Stoichiometric Oxidation of Mn₂(2,5-dioxidoterephthalate) (Mn-MOF-74)" *J. Am. Chem. Soc.* **2014**, *136*, 3334-3337.
- (37) Li, M.; **Dincă, M.** "Selective Formation of Biphasic Thin Films of Metal-Organic Frameworks by Potential-Controlled Cathodic Electrodeposition" *Chem. Sci.* **2014**, *5*, 107-111.
- (36) Shustova, N. B.; Cozzolino, A. F.; Reineke, S.; Baldo, M.; **Dincă, M.** "Selective Turn-On Ammonia Sensing Enabled by High-Temperature Fluorescence in Metal-Organic Frameworks with Open Metal Sites" *J. Am. Chem. Soc.* **2013**, *135*, 13326-13329.
- (35) Wade, C. R.; Li, M.; **Dincă, M.** "Facile Deposition of Multicolored Electrochromic MOF Thin Films" *Angew. Chem. Int. Ed.* **2013**, *52*, 13377-13381.
- (34) Brozek, C. K.; **Dincă, M.** "Ti³⁺-, V^{2+/3+}-, Cr^{2+/3+}-, Mn²⁺-, and Fe²⁺-Substituted MOF-5 and Redox Reactivity in Cr- and Fe-MOF-5" *J. Am. Chem. Soc.* **2013**, *135*, 12886-12891.
- (33) Brozek, C. K.; Cozzolino, A. F.; Teat, S. J.; Chen, Y.-S.; **Dincă, M.** "Quantification of Site-Specific Cation Exchange in Metal-Organic Frameworks using Multi-wavelength Anomalous X-ray Dispersion" *Chem. Mater.* **2013**, *25*, 2998-3002.
- (32) Sun, L.; Miyakai, T.; Seki, S.; **Dincă, M.** "Mn₂(2,5-disulfhydrylbenzene-1,4-dicarboxylate): a Microporous MOF with Infinite (-Mn-S-)∞ Chains and High Intrinsic Charge Mobility" *J. Am. Chem. Soc.* **2013**, *135*, 8185-8188.

- (31) Wade, C. R.; Corrales-Sanchez, T.; Narayan, T. C.; **Dincă, M.** "Post-Synthetic Tuning of Hydrophilicity in Pyrazolate MOFs to Modulate Water Adsorption Properties"
Energy Environ. Sci. **2013**, 6, 2172-2177.
- (30) Bertrand, G. H. V.; Michaelis, V. K.; Ong, T.-C.; Griffin, R. G.; **Dincă, M.** "Thiophene-Based Covalent-Organic Frameworks"
Proc. Nat. Acad. Sci. USA **2013**, 110, 4923-4928.
- (29) McCarthy, B. D.; Hontz, E.R.; Yost, S. R.; Van Voorhis, T.; **Dincă, M.** "Charge Transfer or J-Coupling? Assignment of an Unexpected Red-Shifted Absorption Band in a Naphthalenediimide-Based Metal-Organic Framework"
J. Phys. Chem. Lett. **2013**, 4, 453-458.
- (28) Shustova, N. B.; Cozzolino, A. F.; **Dincă, M.** "Conformational Locking by Design: Relating Strain Energy with Luminescence and Stability in Rigid Metal-Organic Frameworks"
J. Am. Chem. Soc. **2012**, 134, 19596-19599.
- (27) Shustova, N. B.; Ong, T.-C.; Cozzolino, A. F.; Michaelis, V. K.; Griffin, R. G.; **Dincă, M.** "Phenyl Ring Dynamics in a Tetraphenylethylene-Bridged Metal-Organic Framework: Implications for the Mechanism of Aggregation-Induced Emission"
J. Am. Chem. Soc. **2012**, 134, 15061-15070.
- (26) Narayan, T. C.; Miyakai, T.; Seki, S.; **Dincă, M.** "High Charge Mobility in a Tetrathiafulvalene-Based Microporous Metal-Organic Framework"
J. Am. Chem. Soc. **2012**, 134, 12932-12935.
- (25) Brozek, C. K.; **Dincă, M.** "Lattice-Imposed Geometry in Metal-Organic Frameworks: Lacunary Zn₄O Clusters in MOF-5 Serve as Tripodal Chelating Ligands for Ni²⁺"
Chem. Sci. **2012**, 3, 2110-2113.
- (24) Wade, C. R.; **Dincă, M.** "Investigation of the Synthesis, Activation, and Isothermic Heats of CO₂ Adsorption of the Isostructural Series of Metal-Organic Frameworks M₃(BTC)₂ (M = Cr, Fe, Ni, Cu, Mo, Ru)"
Dalton Trans. **2012**, 41, 7931-7938.
- (23) Shustova, N. B.; McCarthy, B. M.; **Dincă, M.** "Turn-On Fluorescence in Tetraphenylethylene-Based Metal-Organic Frameworks: an Alternative to Aggregation-Induced Emission"
J. Am. Chem. Soc. **2011**, 133, 20126-20129.
- (22) Li, M.; **Dincă, M.** "Reductive Electrosynthesis of Crystalline Metal-Organic Frameworks"
J. Am. Chem. Soc. **2011**, 133, 12926-12929.

Doctoral and postdoctoral research:

- (21) Sumida, K.; Stüch, D.; Mino, L.; Chai, J.-D.; Zavorotynska, O.; Murray, L. J.; **Dincă, M.**; Chavan, S.; Bordiga, S.; Head-Gordon, M.; Long, J. R. "Impact of Metal and Anion Substitutions on the Hydrogen Storage Properties of M-BTT Metal-Organic Frameworks"
J. Am. Chem. Soc. **2013**, 135, 1083-1091.
- (20) Sumida, K.; Her, J.-H.; **Dincă, M.**; Murray, L. J.; Schloss, J.; Pierce, C. J.; Thompson, B. A.; Fitzgerald, S.; Brown, C. M.; Long, J. R. "Neutron Scattering and Spectroscopic Studies of Hydrogen Adsorption in Cr₃(BTC)₂ – A Metal-Organic Framework with Exposed Cr²⁺ Sites"
J. Phys. Chem. C **2011**, 115, 8414-8421.
- (19) Murray, L. J.; **Dincă, M.**; Yano, J.; Chavan, S.; Bordiga, S.; Brown, C. M.; Long, J. R. "Highly Selective and Reversible O₂ Binding in Cr₃(1,3,5-benzenetricarboxylate)₂"
J. Am. Chem. Soc. **2010**, 132, 7856-7857.
- (18) Kanan, M. W.; Yano, J.; Surendranath, Y.; **Dincă, M.**; Yachandra, V. K.; Nocera, D. G. "Structure and Valency of a Cobalt-Phosphate Water Oxidation Catalyst Determined by in situ X-ray Spectroscopy"
J. Am. Chem. Soc. **2010**, 132, 13692-13701.
- (17) McAlpin, J. G.; Surendranath, Y.; **Dincă, M.**; Stich, T. A.; Stoian, S. A.; Casey, W.; Nocera, D. G.; Britt, R. D. "EPR Evidence for Co(IV) Species Produced During Water Oxidation at Neutral pH"
J. Am. Chem. Soc. **2010**, 132, 6882-6883.
- (16) **Dincă, M.**; Surendranath, Y.; Nocera, D. "A Nickel-Based Water Oxidation Catalyst that Functions under Benign Conditions"
Proc. Nat. Acad. Sci. USA **2010**, 107, 10337-10341.
- (15) Choi, H. J.; **Dincă, M.**; Dailly, A.; Long, J. R. "Hydrogen Storage in Water-Stable Metal-Organic Frameworks Incorporating 1,3- and 1,4-Benzenedipyrazolate"
Energy Environ. Sci. **2010**, 3, 117-123.

- (14) Surendranath, Y.; **Dincă, M.**; Nocera, D. G. "Electrolyte-Dependent Electrosynthesis and Activity of Cobalt Based Water Oxidation Catalysts"
J. Am. Chem. Soc. **2009**, *131*, 2615-2620.
- (13) Murray, L. J.; **Dincă, M.**; Long, J. R. "Hydrogen Storage in Metal-Organic Frameworks"
Chem. Soc. Rev. **2009**, *38*, 1294-1314. **(Review)**
- (12) **Dincă, M.**; Dailly, A.; Long, J. R. "Structure and Charge Control in Metal-Organic Frameworks Based on the Tetrahedral Ligand Tetrakis(4-tetrazolylphenyl)methane"
Chem. Eur. J. **2008**, *14*, 10280-10285.
- (11) Choi, H. J.; **Dincă, M.**; Long, J. R. "Broadly Hysteretic H₂ Adsorption in the Microporous Metal-Organic Framework Co(1,4-benzenedipyrazolate)"
J. Am. Chem. Soc. **2008**, *130*, 7848-7850.
- (10) **Dincă, M.**; Long, J. R. "Hydrogen Storage in Microporous Metal-Organic Frameworks with Exposed Metal Sites"
Angew. Chem. Int. Ed. **2008**, *47*, 6766-6779. **(Review)**
- (9) Horike, S.; **Dincă, M.**; Tamaki, K.; Long, J. R. "Size-Selective Lewis-Acid Catalysis in a Microporous Metal-Organic Framework with Exposed Mn²⁺ Coordination Sites"
J. Am. Chem. Soc. **2008**, *130*, 5854-5855.
- (8) **Dincă, M.**; Harris, T. D.; Iavarone, A. T.; Long, J. R. "Synthesis and Characterization of the Cubic Coordination Cluster [Co^{III}₆Co^{II}₂(IBT)₁₂]¹⁴⁻ (H₃IBT = 4,5-bis(tetrazol-5-yl)imidazole)"
J. Mol. Struct. **2008**, *890*, 139-143.
- (7) **Dincă, M.**; Dailly, A.; Tsay, C.; Long, J. R. "Expanded Sodalite-Type Metal-Organic Frameworks: Increased Stability and H₂ Adsorption through Ligand-Directed Catenation"
Inorg. Chem. **2008**, *47*, 11-13.
- (6) **Dincă, M.**; Long, J. R. "High-Enthalpy Hydrogen Adsorption in Cation-Exchanged Variants of the Microporous Metal-Organic Framework Mn₃[(Mn₄Cl)₃(BTT)₈(CH₃OH)₁₀]₂"
J. Am. Chem. Soc. **2007**, *129*, 11172-11176.
- (5) **Dincă, M.**; Han, W. S.; Liu, Y.; Dailly, A.; Brown, C. M.; Long, J. R. "Observation of Cu^I-H₂ Interactions in a Fully-Desolvated, Sodalite-Type Metal-Organic Framework"
Angew. Chem. Int. Ed. **2007**, *46*, 1419-1422.
- (4) **Dincă, M.**; Dailly, A.; Liu, Y.; Brown, C. M.; Neumann, D. A.; Long, J. R. "Hydrogen Storage in a Metal-Organic Framework with Exposed Mn²⁺ Coordination Sites"
J. Am. Chem. Soc. **2006**, *128*, 16876-16883.
- (3) **Dincă, M.**; Yu, A. F.; Long, J. R. "Microporous Metal-Organic Frameworks Incorporating 1,4-Benzeneditetrazolate: Syntheses, Structures, and Hydrogen Storage Properties"
J. Am. Chem. Soc. **2006**, *128*, 8904-8913.
- (2) **Dincă, M.**; Long, J. R. "Strong H₂ Binding and Selective Gas Adsorption within the Three-dimensional Coordination Solid Mg₃(O₂C-C₁₀H₆-CO₂)₃"
J. Am. Chem. Soc. **2005**, *127*, 9376-9377.
- (1) Abergel, R. J.; **Dincă, M.** "9,10-dibromotriptycene"
Acta Crystallogr. **2004**, *E60*, o1248-o1249.

Patents

- (1) Nocera, D. G.; Kanan, M. W.; Surendranath, Y.; **Dincă, M.** "Catalyst Compositions and Electrodes for Photosynthesis Replication and Other Electrochemical Techniques" **2009** – US Patent Serial No. 12/486,694.
- (2) **Dincă, M.**; Li, M. "Methods for Electrochemically Induced Cathodic Deposition of Crystalline Metal-Organic Frameworks" – US Patent Serial No. 13/439,355, US Patent 8,764,887 (**2014**).
- (3) **Dincă, M.**; Wade, C. R. "Compositions and methods comprising porous metal-organic frameworks and related uses" **2014** – US Patent Application No. 14/270,385.
- (4) **Dincă, M.**; Sheberla, D.; Sun, L.; Wade, C. R. "Compositions and methods comprising conductive metal-organic frameworks and uses thereof" **2014** – US Provisional Application No. 61/988,952; 62/091,100.
- (5) **Dincă, M.**; Metzger, E. M.; Brozek, C. K. "COMPOSITIONS AND METHODS FOR SELECTIVE OLEFIN OLIGOMERIZATION COMPRISING METAL ORGANIC FRAMEWORKS" **2015** – US Provisional Application (62/218,003, 09/14/2015)