

## Biographical Sketch

## Mohamed Eddaoudi

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### A. Professional Preparation

Ibnou Zohr University, Agadir, Morocco.  
Denis Diderot University, Paris VII, Paris, France  
Denis Diderot University, Paris VII, Paris, France  
Arizona state University Chemistry of materials

Physical Chemistry B.S., 1991  
Materials analysis M.S., 1992  
Chemistry science Ph.D., 1996  
Postdoc, 1997 – 1999

### Honors and Affiliations

- NSF-Career Award, division of materials research (DMR) (2006)
- Outstanding Undergraduate Teaching Award, Department of Chemistry, University of South Florida (2005)
- Outstanding Faculty Research Achievement Award, University of South Florida (2004)
- Presidential Young Faculty appreciation Award, University of south Florida (2003)
- Ph.D chemistry in France with “felicitations du jury” highly honored for the year 1996, attributed to the top 10% graduated Ph.D students each year.
- Moroccan government Scholarship for best bachelor graduate student of 1991 towards Ph.D. degree at the University Paris VII, France (Sept 1991-Jun1996)
- American Chemical Society (1997-)

### B. Appointments

- Assistant Professor of Chemistry, University of South Florida 2002 –
- Research Associate Chemistry, University of Michigan 1999-2002

### C. Publications

- Liu, Y.; Kravtsov, V.; R. Larsen; Eddaoudi M. “Building blocks approach to zeolite-like metal organic frameworks with extra-large cavities” *Chem. Commun in press* (2006)
- Liu, Y.; Kravtsov, V.; Beauchamp D. A.; Eubank J. F.; Eddaoudi M. “4-connected metal-organic assemblies mediated via heterochelation and bridging of single metal ions: Kagome lattice and the  $M_6L_{12}$  octahedron” *J. Am. Chem. Soc.* 127, 7266-7267 (2005)
- Eubank, J. F.; Walsh, R. D.; Eddaoudi, M. “Terminal co-ligand directed synthesis of a neutral, noninterpenetrated (10,3)-a metal-organic framework” *Chem. Commun* 2095-2097 (2005)
- Liu, Y.; Kravtsov, V.; Walsh, R. D.; Poddar, P.; Srikanth, H.; Eddaoudi, M. “Directed assembly of metal-organicubes from deliberately pre-designed molecular building blocks” *Chem. Commun.* 2806-2807 (2004)
- Chae, H. K.; Siberio-Perez, D. Y.; Kim, J.; Go. Y.; Eddaoudi, M.; Matzger, A. J.; O’Keeffe, M.; Yaghi, O. M. “A route to high surface area, porosity and inclusion of larges molecules in crystals” *Nature*, 427, 523 (2004).
- Rosi, N.; Eckert, J.; Eddaoudi, M.; Vodak, D.; Kim, J.; M. O’Keeffe, Yaghi O. M. “Hydrogen storage in microporous metal-organic frameworks” *Science* 2003, 300, 1127-1129 5.
- Eddaoudi, M.; Kim, J.; Rosi, N.; Vodak, D.; Wachter, J.; O’Keeffe, M.; Yaghi, O. M. “Systematic Design of Pore Size and Functionality in Isorecticular MOFs and Their Application in Methane Storage” *Science*, 295, 469-472.(2002)
- Yaghi, O. M.; O’Keeffe, M.; Ockwig, N. W.; Chae, H. K.; Eddaoudi, M.; Kim, J.”Reticular synthesis and the design of new materials” *Nature*, 423, 705 (2003).
- Rosi, N. L.; Eckert, J.; Eddaoudi, M.; Vodak, D. T.; Kim, J.; O’Keeffe, M.; Yaghi, O. M. ”Hydrogen storage in microporous metal-organic frameworks” *Science*, 300, 1127 (2003).

- Rosi, N. L.; Eddaoudi, M.; Kim, J.; O'Keeffe, M.; Yaghi, O. M. "Advances in the chemistry of metal-organic frameworks" *Crys Eng. Comm*, 401 (2002)
- Eddaoudi, M.; Kim, J.; Vodak, D.; Sudik, A.; Wachter, J.; O'Keeffe, M.; Yaghi, O. M. "Geometric requirements and examples of important structures in the assembly of square building blocks" *PNAS*, 99 (8): 4900 (2002)
- Rosi, N. L.; Eddaoudi, M.; Kim, J.; O'Keeffe, M.; Yaghi, O. M. "Infinite secondary building units and forbidden catenation in metal-organic frameworks" *Angew. Chem. Int. Ed*, 41 (2): 284 (2002)
- Eddaoudi, M.; Kim, J.; Rosi, N.; Vodak, D.; Wachter, J.; O'Keeffe, M.; Yaghi, O. M. "Systematic design of pore size and functionality in isorecticular MOFs and their application in methane storage" *Science* 295, 469 (2002)
- Eddaoudi, M.; Kim, J.; O'Keeffe, M.; Yaghi, O. M. " $\text{Cu}_2[\text{o-Br-C}_6\text{H}_3(\text{CO}_2)_2]_2(\text{H}_2\text{O})_2(\text{DMF})_8(\text{H}_2\text{O})_2$ : A framework deliberately designed to have the NbO structure type" *J. Amer. Chem. Soc.* 124, 376 (2002)
- Vodak, D. T.; Braun, M. E.; Kim, J.; Eddaoudi, M.; Yaghi, O. M. "Metal-organic frameworks constructed from pentagonal antiprismatic and cuboctahedral secondary building units" *Chem. Comm.* 24, 2534 (2001)
- Chae, H. K.; Eddaoudi, M.; Kim, J.; Hauck, S. I.; Hartwig, J. F.; O'Keeffe, M.; Yaghi, O. M. "Tertiary building units: Synthesis, structure, and porosity of a metal-organic dendrimer framework (MODF-1)" *J. Amer. Chem. Soc.*, 123, 11482 (2001)
- Kim, J.; Chen, B. L.; Reineke, T. M.; Li, H. L.; Eddaoudi, M.; Moler, D. B.; O'Keeffe, M.; Yaghi, O. M. "Assembly of metal-organic frameworks from large organic and inorganic secondary building units: New examples and simplifying principles for complex structures" *J. Amer. Chem. Soc.* 123, 8239 (2001)
- Eddaoudi, M.; Kim, J.; Wachter, J. B.; Chae, H. K.; O'Keeffe, M.; Yaghi, O. M. "Porous metal-organic polyhedra: 25 angstrom cuboctahedron constructed from 12  $\text{Cu}_2(\text{CO}_2)_4$  paddle-wheel building blocks" *J. Amer. Chem. Soc.*, 123, 4368 (2001)
- Eddaoudi, M.; Moler, D. B.; Li, H. L.; Chen, B. L.; Reineke, T. M.; O'Keeffe, M.; Yaghi, O. M. "Modular chemistry: Secondary building units as a basis for the design of highly porous and robust metal-organic carboxylate frameworks" *Acc. Chem. Res.*, 34 (4): (2001)
- Chen, B. L.; Eddaoudi, M.; Hyde, S. T.; O'Keeffe, M.; Yaghi, O. M. "Interwoven metal-organic framework on a periodic minimal surface with extra-large pores" *Science* 291, 1021 (2001)
- Li, H.; Eddaoudi, M.; Plevart, J.; O'Keeffe, M.; Yaghi, O. M. " $\text{Ge}_2\text{ZrO}_6\text{F}_2 \cdot (\text{H}_2\text{DAB})\text{H}_2\text{O}$ : a 4-connected microporous material with "bow tie" building units and an exceptional proportion of 3-rings" *J. Amer. Chem. Soc.*, 122, 12409 (2000)
- Chen, B. L.; Eddaoudi, M.; Reineke, T. M.; Kampf, J. W.; O'Keeffe, M.; Yaghi, O. M. " $\text{Cu}_2(\text{ATC}) \cdot 6\text{H}_2\text{O}$ : Design of open metal sites in porous metal-organic crystals (ATC : 1,3,5,7-adamantane tetracarboxylate)" *J. Amer. Chem. Soc.*, 122, 11559 (2000)
- O'Keeffe, M.; Eddaoudi, M.; Li, H. L.; Reineke, T.; Yaghi, O. M. "Frameworks for extended solids: Geometrical design principles" *J. Solid State Chem.* 152, 3 (2000)
- Reineke, T. M.; Eddaoudi, M.; Moler, D.; O'Keeffe, M.; Yaghi, O. M. "Large free volume in maximally interpenetrating networks: The role of secondary building units exemplified by  $\text{Tb}_2(\text{ADB})_3[(\text{CH}_3)_2\text{SO}]_4 \cdot 16[(\text{CH}_3)_2\text{SO}]$ " *J. Amer. Chem. Soc.*, 122, 4843 (2000)
- Eddaoudi, M.; Li, H. L.; Yaghi, O. M. "Highly porous and stable metal-organic frameworks: Structure design and sorption properties", *J. Amer. Chem. Soc.* 122, 1391 (2000)
- Li, H.; Eddaoudi, M.; O'Keeffe, M.; Yaghi, O. M. "Design and synthesis of an exceptionally stable and highly porous metal-organic framework" *Nature*, 402, 276-279 (1999)
- Reineke, T. M.; Eddaoudi, M.; O'Keeffe, M.; Yaghi, O. M. "A microporous lanthanide-organic framework" *Angew. Chem. Int. Ed*, 38, 2590 (1999)
- Eddaoudi, M.; Li, H. L.; Reineke, T.; Fehr, M.; Kelley, D.; Groy, T. L.; Yaghi, O. M. "Design and synthesis of metal-carboxylate frameworks with permanent microporosity" *Top. Catal.*, 9, 105 (1999)
- Li, H. L.; Eddaoudi, M.; Laine, A.; O'Keeffe, M.; Yaghi, O. M. "Noninterpenetrating indium sulfide supertetrahedral cristobalite framework" *J. Amer. Chem. Soc.* 121, 6096 (1999)

- Reineke, TM; Eddaoudi, M; Fehr, M; Kelley, D; Yaghi, OM "From condensed lanthanide coordination solids to microporous frameworks having accessible metal sites", *J. Amer. Chem. Soc.* 121, 1651 (1999)
- Li, H. L.; Eddaoudi, M.; Yaghi, O. M. "An open-framework germanate with polycubane-like topology Source": *Angew. Chem. Int. Edit.*, 38, 653 (1999)
- Li, H.; Eddaoudi, M.; Richardson, D. A.; Yaghi, O. M. "Porous germanates: Synthesis, structure, and inclusion properties of  $\text{Ge}_7\text{O}_{14}\cdot 5\text{F}_2 \cdot [(\text{CH}_3)_2\text{NH}_2]_3(\text{H}_2\text{O})_{0.86}$ " *J. Amer. Chem. Soc.*, 120, 8567 (1998)
- Li, H.; Eddaoudi, M.; Groy, T. L.; Yaghi, O. M. "Establishing microporosity in open metal-organic frameworks: Gas sorption isotherms for  $\text{Zn}(\text{BDC})$  (BDC = 1,4-benzenedicarboxylate)" *J. Amer. Chem. Soc.*, 120, 8571 (1998)
- Eddaoudi, M.; Coleman, A. W.; Baszkin, A. "Chiral recognition by molecular monolayers: Inclusion of terpenes in tert-butyltrimethylsilyl- $\alpha$ -D-glucopyranoside" *Supramol. Chem.* 8, 177 (1997)
- Eddaoudi, M.; Coleman, A. W.; Junk, P. C. "Solubilities of the cyclodextrins in the presence of transition metal salts" *J. Inclus. Phenom. Mol.* 26, 133 (1996)
- Eddaoudi, M.; ParrotLopez, H.; deLamotte, S. P.; Ficheux, D.; Prognon, P.; Coleman, A. W. "Fluorescent amino acids as reporter systems in peptido-cyclodextrin inclusion compounds" *J. Chem. Soc. Perkin. T 2*, 1711 (1996)
- Eddaoudi, M.; Coleman, A. W.; Prognon, P.; LopezMahia, P. "Steady state fluorescence studies of the complexes between pyrene and per-6-O-tert-butyltrimethylsilyl  $\alpha$ -,  $\beta$ - and  $\gamma$ -cyclodextrins" *J. Chem. Soc. Perkin. T 2*, 955 (1996)
- Eddaoudi, M.; Baszkin, A.; Parrot-Lopez, H.; Boissonade, M.; Coleman, A. W. "Divalent-cation cyclodextrin interactions at the air-water interface: a three stage process" *Langmuir*, 11, 13 (1995)

#### D. Patents and Invention disclosure:

- Mueller, Ulrich; Lobree, Lisa; Hesse, Michael; Yaghi, Omar M.; Eddaoudi, Mohamed: "Process for epoxidation of organic compounds with oxygen or oxygen-delivering compounds using catalysts containing metal-organic framework (MOF) materials" *U.S. Pat. Appl. Publ.* (2003); 13 pp; US20030923
- Mueller, Ulrich; Lobree, Lisa; Hesse, Michael; Yaghi, Omar; Eddaoudi, Mohamed: "Shaped bodies containing metal-organic frameworks" *U.S. Pat. Appl. Publ.* (2003); 16 pp; US 2003222023.
- Harth, Klaus; Hesse, Michael; Lobree, Lisa; Harder, Wolfgang; Hoelzie, Markus; Mueller, Ulrich; Yaghi, Omar M.; Eddaoudi, Mohamed: "Method for Storing, Absorbing and Emmiting Gases using Novel Framework Materials" *U.S. Pat. Appl. Publ.* (2003); 8 pp; US2003148165
- Kim, Jaheon; Li, Hailian; Rosi, Nathaniel; Yaghi, Omar M; Eddaoudi, Mohamed: "Isorecticular metal-organic frameworks, process for forming the same, and systematic design of pore size and functionality therein, with application for gas storage" *U.S. Pat. Appl. Publ.* (2003); 57 pp; US2003004364
- Invention disclosure: Eddaoudi, Mohamed: "Zeolite-like Metal-Organic Frameworks (ZMOFs): Modular Approach to the synthesis of Organic-inorganic Hybrid Porous Materials having a Zeolite like Topology" *December 2003* (No. USF-197P; USF#-03b115)

#### E. Synergetic Activities

##### (i) Teaching Experience:

Introduction to Inorganic Chemistry (CHM3610 and CHM3610L), University of South Florida, (2003-2005).  
Advanced Inorganic Chemistry (CHM4611), University of South Florida, (Spring 2003).

##### (ii) Invited Lectures and invited conferences:

- "Bottom up Synthesis of Crystalline Materials Using Top Down Design" Gordon Conference, CRC Solid State Chemistry, July 28- August 2, 2002, New London, NH
- "Design and synthesis of extended metal-organic frameworks (MOFs)" 79<sup>th</sup> Annual Florida Meeting and Exposition FAME 2003, May 8-10<sup>th</sup>, 2003, Orlando, Florida.

- “Design and synthesis of rigid porous metal-organic frameworks” Crystal Engineering: Supramolecular Synthesis of Advanced Materials, 39<sup>th</sup> IUPAC congress and 86<sup>th</sup> Conference of The Canadian Society for Chemistry, August 10-15<sup>th</sup>, **2003**, Ottawa, Canada.
- “Novel Approach for the Design and Synthesis of rigid porous metal-organic frameworks” Advances in Supramolecular Chemistry MWRM 2003, 38<sup>th</sup> Midwest Regional Meeting November 5-7<sup>th</sup>, **2003** Columbia, Missouri
- “Use of Secondary building units (SBUs) in the design and synthesis of rigid porous frameworks” New Materials by Crystal Engineering Design, ICMAT 2003, December 8-12<sup>th</sup>, **2003**, Singapore

**(iii) Others:**

Organized a mini international symposium entitled: “New Horizons in Chemistry I: Molecular Building Blocks Approach to Functional Materials” University of South Florida, Feb 6-7, 2004.

Organized a symposium entitled: “Molecular Building Blocks approach to Functional Materials” at the 80<sup>th</sup> Annual Florida Meeting and Exposition FAME 2004, May 6-18<sup>th</sup>, 2004, Orlando, Florida.

**F. Collaborators and Other Affiliations**

**(i) Collaborators**

- Randy Larsen, Department of Chemistry, University of South Florida, Tampa, FL
- Brian Space, Department of Chemistry, University of South Florida, Tampa, FL
- Mike Zaworotko Department of Chemistry, University of South Florida, Tampa, FL
- Hariharan Srikanth, Department of Physics, University of South Florida, Tampa FL
- Victor Kravtsov, Institute of Applied Physics, Chisinau, Moldova
- Juergen Eckert Materials Research Laboratory University of California and Los Alamos Neutron Scattering Center, Los Alamos National Laboratory

**(ii) Graduate and Postdoctoral Advisors**

- Dr. Anthony W. Coleman (Ph.D. advisor, Denis Diderot University, Paris VII, Paris, France)
- Prof. Omar M. Yaghi (Postdoctoral advisor, Arizona State University and University of Michigan)

**(iii) Thesis advisor and Postgraduate-scholar Sponsor**

- Jarrod Eubank, University of South Florida, Ph.D. (2007)
- Jacilynn Brant, University of South Florida, Ph.D. (2007)
- Dorina Sava, University of South Florida, Ph.D. (2007)
- Amy Cairns, University of South Florida, Ph.D. (2008)
- ChungSik Kim, University of South Florida, Ph.D. (2010)
- Farid Nouar. University of South Florida, Ph.D. (2010)
- Mohamed Alkordi, University of South Florida, Ph.D. (2010)