

Dr. Elisabetta Alberico

Researcher

Istituto di Chimica Biomolecolare ICB-CNR

ORCID <https://orcid.org/0000-0002-1143-6032>

ResearcherID C-5378-2015

Research

Design and synthesis of novel homogeneous catalysts based on noble and non-noble transition metals, for hydrogenation, transfer hydrogenation and dehydrogenation reactions. Development of homogeneous catalytic processes for the reduction of multiple bonds as key steps in the synthesis of molecules of industrial relevance. Homogeneously catalyzed hydrogen generation from renewables (methanol, formic acid) under mild conditions. Investigations into the mechanism of the reactions catalyzed by the developed catalysts.

Education

- Ph. D. in Chemistry with honours (Summa cum Laude), April 2003, Rheinisch-Westfaelische-Technische-Hochschule Aachen, Germany
- Master Degree in Chemistry with honours (Summa cum Laude), November 1993, University of Sassari, Italy

Fellowships

- Scholarship for a research stay in Germany awarded by the German Academic Exchange Service (DAAD)
- Doctoral fellowship awarded by the Deutsche Forschungsgemeinschaft (DFG)
- Scholarship awarded by the Natural Sciences and Engineering Research Council of Canada (NSERCC)

Professional Experience

- Italian National Scientific Habilitation for Associate Professorship, Industrial Chemistry (03/C2), valid from 14/01/2020 until 14/01/2029.
- Italian National Scientific Habilitation for Associate Professorship, Organic Chemistry (03/C1), valid from 17/01/2020 AL 17/01/2029.
- Researcher, Institute of Biomolecular Chemistry, National Research Council, Italy, April 2001 to date.
- Research Associate to Prof. Matthias Beller, Leibniz Institute for Catalysis, Rostock, Germany, October 2011 to date.
- Research Associate to Prof. Serafino Gladiali, Department of Chemistry, University of Sassari, Italy, January 1998 – October 1998
- Research Associate to Prof. Howard Alper, University of Ottawa, Ontario, Canada, March 1997 – December 1997
- Research Associate to Dr. Mauro Marchetti, National Research Council, Sassari, Italy, January 1995 – February 1996

Selected Publications

1. **Alberico E.**, Leischner T., Junge H., Kammer A., Sang R., Seifert J., Baumann W., Spannenberg A., Junge K., Beller M. HCOOH disproportionation to MeOH promoted by molybdenum PNP complexes, *Chem. Sci.* **2021** DOI: 10.1039/d1sc04181a
2. Schwarz C. H., Kraus D., **Alberico E.**, Junge H., Haumann M. Immobilized Ru-Pincer Complexes for Continuous Gas-Phase Low-Temperature Methanol Reforming-Improving the Activity by a Second

- Ru-Complex and Variation of Hydroxide Additives, *Eur. J. Inorg. Chem.* **2021**, 1745–1751, DOI: 10.1002/ejic.202100042
- Léval, A.; Agapova, A.; Steinlechner, C.; **Alberico, E.**; Junge, H.; Beller, M., Hydrogen production from formic acid catalyzed by a phosphine free manganese complex: investigation and mechanistic insights, *Green Chem.*, **2020**, *22*, 913–920, DOI: 10.1039/c9gc02453k
 - Alberico, E.**; Möller, S.; Moritz, H.; Drexler, H.-J.; Heller, D., Activation, Deactivation and Reversibility Phenomena in Homogeneous Catalysis: A Showcase Based on the Chemistry of Rhodium/Phosphine Catalysts, *Catalysts*, **2019**, *9*, 582-626, DOI: 10.3390/catal9070582
 - Agapova, A.; **Alberico, E.**; Kammer, A.; Junge, H.; Beller, M., Catalytic Dehydrogenation of Formic Acid with Ruthenium-PNP-Pincer Complexes: Comparing N-Methylated and NH-Ligands, *ChemCatChem*, **2019**, *11*, 1910-1914, DOI: 10.1002/cctc.201801897
 - Papa, V.; Cabrero-Antonino, J. R.; **Alberico, E.**; Spanneberg, A.; Junge, K.; Junge, H.; Beller, M., Efficient and selective hydrogenation of amides to alcohols and amines using a well-defined manganese-PNN pincer complex. *Chem. Sci.* **2017**, *8*, 3576-3585, DOI: 10.1039/c7sc00138j
 - Cabrero-Antonino, J. R.; **Alberico, E.**; Drexler, H.-J.; Baumann, W.; Junge, K.; Junge, H.; Beller, M., Efficient Base-Free Hydrogenation of Amides to Alcohols and Amines Catalyzed by Well-Defined Pincer Imidazolyl-Ruthenium Complexes, *ACS Catalysis* **2016**, *6*, 47-54, DOI: 10.1021/acscatal.5b01955
 - Alberico, E.**; Lennox, A. J. J.; Vogt, L. K.; Jiao, H.; Baumann, W.; Drexler, H.-J.; Nielsen, M.; Spannenberg, A.; Checinski, M. P.; Junge, H.; Beller, M., Unravelling the Mechanism of Basic Aqueous Methanol Dehydrogenation Catalyzed by Ru-PNP Pincer Complexes, *J. Am. Chem. Soc.* **2016**, *138*, 14890-14904, DOI 10.1021/jacs.6b05692
 - Alberico, E.**; Nielsen, M., Towards a methanol economy based on homogeneous catalysis: methanol to H₂ and CO₂ to methanol, *Chem. Comm.* **2015**, 6714-6725, DOI: 10.1039/c4cc09471a
 - Bornschein C., Werkmeister S., Wendt B., Jiao H., **Alberico E.**, Baumann W., Junge H., Junge K., Beller M., Mild and selective Hydrogenation of Aromatic and Aliphatic (di)Nitriles with a well defined Iron Pincer complex, *Nat. Commun.* **2014**, *5*:4111, DOI 10.1038/ncomms5111,
 - Werkmeister S., Junge K., Wendt B., **Alberico E.**, Jiao H., Baumann W., Junge H., Gallou F., Beller M., Hydrogenation of Esters to Alcohols with a Well-Defined Iron Complex, *Ang. Chem. Int. Ed.* **2014**, *53*, 8722-8726, DOI: 10.1002/anie.201402542
 - Alberico, E.**; Sponholz, P.; Cordes, C.; Nielsen, M.; Drexler, H.-J.; Baumann, W.; Junge, H.; Beller, M., Selective Hydrogen Production from Methanol with a Defined Iron Pincer Catalyst under Mild Conditions, *Angew. Chem. Int. Ed.* **2013**, *52*, 14162-14166, DOI: 10.1002/anie.201307224
 - Nielsen, M.; **Alberico, E.**; Baumann, W.; Drexler, H.-J.; Junge, H.; Gladiali, S.; Beller, M., Low temperature aqueous-phase methanol dehydrogenation to hydrogen and carbon dioxide, *Nature*, **2013**, *495*, 85-89, DOI: 10.1038/nature11891
 - Alberico, E.**; Baumann, W.; de Vries, J. G.; Drexler, H.-J.; Gladiali, S.; Heller, D.; Henderickx, H. J W; Lefort, L., Unravelling the reaction path of rhodium-MonoPhos-catalysed olefin hydrogenation, *Chem. Eur. J.*, **2011**, *17*, 12683-12695, DOI: 10.1002/chem.201101793
 - Gladiali, S.; **Alberico, E.**, Asymmetric transfer hydrogenation: chiral ligands and applications, *Chem. Soc. Rev.*, **2006**, *35*, 226-236.
 - Parker H. S., **Alberico E.**, Alper H., Regio- and Stereoselective Synthesis of key 1-Methyl Carbapenem via Hydroformylation Using a Zwitterionic Rhodium Catalyst, *J. Am. Chem. Soc.*, **1999**, *121*, 11697-11703.