

Professor Dr. Gerard van Koten, Short CV

Gerard van Koten (born 1942) is Professor of Organic Chemistry and Catalysis at the Debye Institute of the Utrecht University (since 1986). He studied at Utrecht University (Master of Science 1967). In 1967 he joined the Institute for Organic Chemistry, TNO as a permanent staff member and obtained his PhD (1974; Summa Cum Laude) from the Utrecht University (Prof. Dr. G.J.H. van der Kerk). In 1977 he moved to the University of Amsterdam (Inorganic Chemistry) where he was appointed professor (personal chair) in Organometallic Chemistry. In 1986 he moved to Utrecht University where he occupied the Chair of Organic Chemistry and Catalysis. February 2004 (to 2012) he was appointed Distinguished University Professor of the Utrecht University. He retired 6 September 2007 and was appointed Honorary University Professor. In October 2007 he was appointed Part Time Distinguished Research Professor of the University of Cardiff (UK) (2007-2010) and Honorary Distinguished Professor (2011- 2015).



Science interests

His research interests comprise the study of fundamental processes in organometallic chemistry, the application of organometallic complexes as catalysts for homogeneous catalysis, in particular for fine-chemical synthesis, and as materials with special physicochemical properties (molecular wires and switches). He is well known for his ground breaking fundamental and applied research on XCX-pincer metal complexes that is a field of research he started with the finding of the first examples of metal-mediated, reversible C-C bond cleavage reactions in 1978. The preparation and use of the first examples of homogeneous metallodendrimer catalysts demonstrate his interest for supramolecular systems with (organometallic) catalytically active functionalities. Recent developments involve the introduction of the XCX-pincer metal units in polypeptide chains, carbohydrates and in the active site of serine hydrolases. Furthermore, systems are under development for cascade catalysis that is connected to his current interest in the development of sustainable (green) chemistry.

He is author of over 800 scientific publications and review papers and of 35 patents. Total citations 23,575 (for 755 papers), h-index 66. He has been thesis supervisor for over 85 PhD theses.

International Research Projects

-He was engaged in several international research projects such as: Ciba-Geigy A.G., Basel: Support by CIDNAP and ENDOR-ESR experiments on persistent organometallic radicals; E.E.G.: Nucleophilic substitutions on arenoniumplatinum compounds, 1987-1988; E.E.G.: Novel heterocyclic compounds through ring enlargement of metallocycles, by alkyne insertions and subsequent ring closure. Joint project together with Dr. M. Pfeffer, Université Louis Pasteur, Strasbourg, France 1986-1989; E.E.G.: Study of the enantioselective substrate recognition by chiral organocopper reagents. Structural features of reacting species and applications in asymmetric syntheses. Joint project (1986-1989) together with Dr. P. Braunstein, Université Louis Pasteur, Strasbourg, France; *EEG*: Synthesis, Mechanism and Structure in Organopalladium- Catalyzed reactions 1990-1994, Joint Project together with Dr. M. Pfeffer, Dr. A. Dedieu (Université Louis Pasteur, Strasbourg France) and Dr. J.M. Brown (University of Oxford, England); *Coordinator of the Human Capital and Mobility Network, EC*, "Metal-mediated and Catalyzed Organic Synthesis". Participating groups are: G. van Koten, Debye Research Institute, Utrecht University (Network Coordinator), J. Geus, Debye Research Institute, Utrecht University, K. Vrieze, Laboratory of Inorganic Chemistry, University of Amsterdam, P.W.N.M. van Leeuwen, Laboratory of Chemical Technology, University of Amsterdam, M. Pfeffer, Laboratoire de Chimie de Coordination, CNRS, Université Louis Pasteur, Strasbourg, J.A. Osborn, Laboratoire de Catalyse Homogene, CNRS, Université Louis Pasteur, Strasbourg, H. Rudler, Laboratoire de Chimie Organique, CNRS, Université Pierre et Marie Curie, Paris VI, A. Alexakis, Laboratoire de Chimie des Organo-Elements, CNRS, Université Pierre et Marie Curie, Paris VI, B. Chaudret, Laboratoire de Chimie de Coordination, CNRS, Toulouse, W. Keim, Institut für Technische Chemie und Petrochemie der RWTH Aachen, D. Enders, Institut für Organische Chemie der RWTH Aachen, A. Merbach, Institute of Inorganic and Analytical Chemistry, University of Lausanne, J. E. Bäckvall, Institute of Chemistry, University of Uppsala, 1993-2000. Moreover, he was involved in various COST Chemistry Actions, e.g. D2, D8, D12, D24.

Academic Management

He served in a large number of academic management functions and a summary over the past 15 years is presented.

In the Netherlands

- In the period 1995-2000 he was Dean of the Faculty of Chemistry. In September 2003 he became Chairman of the Board of the Faculties of Chemistry, Physics and Astronomy, Mathematics and Information Science, Pharmaceutical Science and Biology. From 2004-2005 he was responsible for

the merger of these five former Faculties into one Faculty of Science. From 2005 until September 2007 he served as Dean of the Faculty of Science of the Utrecht University.

- In 2002 he was appointed as Chairman of the committee responsible for the renewal of the Chemistry Educational Program at Secondary School level by the Minister of Education, Culture and Science (OC&W) and more recently formed a steering group that is responsible for the implementation of the concept-context approach in chemistry. Moreover, in 2003 he was Chairman of an advisory Committee for the renewal of the Secondary School (Pre-University) curriculum of the KNAW that issued the report "Talent for the Pre-University Schools in the Netherlands". He was Member of the committee (Profielcommissie) of the Ministry of Education and Research (OC&W) advising the Minister about the future direction of the pre-university education in the Netherlands.
- -He has been Chairman of the Academy Committee for Chemistry of the Royal Netherlands Academy of Arts and Sciences (KNAW) (1996-2007).
- -He has been Member of the Executive Board of ACTS that organizes private-public investment programs (ACTS Advanced Catalytic Technologies for Sustainability involving joint Academy-Industry research programs in which Catalysis is the key technology (2000-2005).
- He has been one of the founders of the Netherlands Institute for Catalysis Research, NIOK, from which he was Chairman of the Board from 1991 to 1999 and Scientific Director from 2000-2003.
- He was Member of the Scientific Council of the Netherlands Research Combination Catalysis (2006) and is currently Chairman of the International Scientific Board of NRSC-C.
- Presently he is Member of the governmental Foresight group Chemistry (Regiegroep Chemie) (2006-). This Foresight group is responsible for the coordination and initiation of innovation in the Netherlands in Industry and Academia.
- He was a member of the Scientific Advisory Board of Molecular Frontiers that is a world-wide virtual institute that seeks to strengthen the position of Science in Society (2007-2009).
- From January 2008 to December 2009 he acted as President of the Royal Dutch Chemical Society (KNCV).
- He was a Member of the Scientific Council of the Netherlands Research Combination Catalysis (2006) and from 2007 on acts as Chairman of the International Scientific Board.
- He is Member of the Board of the Roosevelt Academy (2007-).

In Europe

- He has been involved with COST Chemistry (EU DG Research) acting as Chair of various research programs from 1993 on, from 1997-200 as Vice-President of the Technical Committee and as President of this Committee from 2000-2003.
- He acted as Chairman of the COST program (EU), Selective synthesis (1993-1994); Coordinator for the EC program Human Capital and Mobility Network "Metal-Mediated and Catalyzed Organic Synthesis (1993 24 months).
- He has been a Member of the Ad-hoc Group Biomaterials, COST (2002-2003).
- He acted as a Member in the review board of the Excellence Initiative by the German Federal and State Governments to promote Science and Research at German Universities (2006-2007) and as Peer reviewer for the ESF (2007-2008) and ERC 2008-2010.
- He has also been a member of the DFG committee Selection Clusters of Excellence and Graduate Schools in Germany, (20-21 November 2006).

Organization of International Conferences and Memberships of International Boards

In addition to the organization of conferences on national level he is member of scientific international advisory boards of a number of international conferences, i.e. OMCOS (IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis), ISOM (International Symposium on Olefin Metathesis), ICOMC (IUPAC International Conference on Organometallic Chemistry). He has been organizer and chairman of the 6th OMCOS in Utrecht in 1991 and the 13th ISOM in Kerkrade in 1999. Furthermore, he organized regularly smaller international symposia in the framework of the EU-networks (in the various Framework Programs) and COST programs he chaired.

Visiting Professorships

He has been visiting Professor in Strasbourg (France), Salt Lake City (US), Sassari (Italy), Heidelberg and Dortmund (Germany), Fribourg (Switzerland), North West Pacific Inorganic Chemistry Lecturer (1999) (Canada/USA), Lausanne (Switzerland) and in Singapore (2008). He has been Merck Lecturer of Organic Synthesis in the UK, Sasol Lecturer in Homogeneous Catalysis in Canada (Ottawa), visiting lectureship at the IQUI Tarragona, visiting Professor at the CaRLa institute for Homogeneous Catalysis in Heidelberg and Jones Lecturer at Queen's University, Kingston, Canada (2010).

Board Membership of Scientific Journals

He was/is board member of a series of scientific journals, e.g. Organometallics and Chemistry-A European Journal, Topics in Organometallic Chemistry, academic advisory board of Advanced Synthesis & Catalysis.

Memberships

- He is member of the Royal Netherlands Academy of Arts and Sciences (KNAW).
- He is Member of the Academy of Technology and Innovation (ACTI).

- He is Member of the KNCV (Royal Netherlands Chemical Society), ACS American Chemical Society) and RCS Royal Society of Chemistry) (FRSC).

Consultancy

He was/is consultant of a number of chemical and pharmaceutical companies, e.g. DSM, Novartis, DOW Chemicals, Ciba Specialty Chemicals (until 2008) and Arkema Vlissingen (current)

Prize Committees

He has served on the Boards of a number of Prize committees of the Utrecht University and of various organizations, e.g. of the Swiss Chemical Society from to 2008, FWO Excellence Prizes 2010 dr de Leeuw-Damry-Boullart, Belgium.

Audit Committees

He participated in various peer review and audit committees, but recent ones are at the University of Antwerp (Department of Chemistry; 2009, Chairman) and the University of Southampton (School of Chemistry; 2009, Member), etc.

Awards

He has been given multiple awards for his achievements in chemistry: 1982 Gold medal for chemistry, Royal Chemical Society of The Netherlands; 1989 Science Exchange program of Germany - The Netherlands; 1991-1992 Fellowship Taiwan Society for the Promotion of Chemistry; 1992-1993 Fellowship Japan Society for the Promotion of Science; 1996 Qualification "Excellent" in the National Audit of the research in chemistry in The Netherlands; 1997 Senior Qualification for teaching of the Utrecht University; 1998 North West Pacific Inorganic Lectureship Canada/USA; 2000 The Gambinus Fellowship, Lecture Dortmund, Germany; 2000 Programme Award Netherlands Foundation for Scientific Research; 2002 Qualification "Excellent" in the National Audit of the research in chemistry in the Netherlands; 2007 Ridder in de Orde van de Nederlandse Leeuw (Knight of the Order of the Dutch Lion).

Recent PhD thesis

2006

R. Kreiter, Triarylphosphines with nucleophilic substituents for the construction of multimetallic and dendritic assemblies, Utrecht, 9/2/2006.

S.Gosiewka, Chiral Pd and Fe complexes of L-proline derived pincer ligands. Structural and catalytic studies, Utrecht, 29/3/2006.

M.Gagliardo, Ru(II) complexes of anionic bisphosphinoaryl ligands as catalysts and building blocks for functional materials, Utrecht, 10/5//2006.

2007

P.C.A.Bruijninx, Structural and functional models of non-heme iron enzymes. A study of the 2-his-1-carboxylate facial triad, Utrecht 31/1/2007.

B.M.J.M.Suijkerbuijk, Pincer-porphyrin hybrids. Synthesis, self-assembly and catalysis, Utrecht 26/2/2007.

N.C.Mehendale, Silica immobilized pincer-metal complexes. Catalyst recycling, and retrospect on active species, Utrecht 14/3/2007.

G.D.Batema, Conjugated ECE-pincer metal complexes. New optical materials and bio-conjugates, Utrecht 12/6/2007.

C.A.Kruihof, Protein-ECE-metallopincer hybrids, Utrecht 1/10/2007.

2008

A.R.McDonald, Immobilized homogeneous catalysts for sequential fine chemical synthesis, Utrecht 4/2/2008.

E.P.L. van der Geer, Novel applications of 3:1 site differentiated [4Fe-4S] clusters, Utrecht 10/3/2008.

S.H.Wadman, Organoruthenium complexes for solar energy harvesting, Utrecht 14/11/2008.

2009

J. Li, Extending the phosphorus-donor manifold from symmetric to unsymmetric in pincer metal catalysts, Utrecht 2/9/2009.

E. Sperotto, Aminoarenethiolate copper(I) and copper(I) halidecatalysts for C-X cross coupling reactions, Utrecht 18/9/2009.

B.Wieczorek, Semisynthetic pincer metalloenzymes. A match between organometallic and protein building blocks, Utrecht 7/10/2009.

D.J.M.Snelders, Oligocationic ammonium functionalized triarylphosphine ligands. Coordination chemistry and application in homogeneous catalysis, Utrecht 16/11/2009.

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