

Preface

This issue is dedicated to Prof. Józef Julian Ziółkowski on the occasion of his 70th birthday in recognition of his important contribution to coordination chemistry and homogeneous catalysis. It contains papers submitted by members of the international chemical community who wish in this way to pay tribute to his scientific achievements and outstanding personality.

Józef Julian Ziółkowski, called by his friends Josef (in England) or Ziutek (in Poland), was born in Husiatyń, a small town which was then in Eastern Poland (now Ukraine). He graduated in chemistry from Wrocław University of Technology in 1957 and currently is Full Professor of chemistry at the University of Wrocław.

Since almost the beginning of his scientific career he has worked in the field of inorganic chemistry, particularly coordination chemistry related to catalysis by metal complexes, both homogeneous and heterogenised ones. In 1964, he defended his Ph.D. thesis “Studies of electronic structure of transition metal pentacyanonitrosyl complexes” supervised by Prof. B. Jeżowska-Trzebiatowska and in 1973 he received his Doctor Habilitatus degree on presentation of the thesis on “Structure and reactivity of bi- and trinuclear rhodium(II) and cobalt(III) complexes”. He was appointed Associate Professor in 1976 and Full Professor in 1984.

Josef’s extraordinary talent and hard work made him an acknowledged leader of catalysis research in Poland, particularly in the area of homogeneous catalysis by metal complexes which he pioneered in this country in the late 1960s. For a number of years, he was a coordinator and co-coordinator of research projects in the field in Poland as well as projects realised within the frames of international cooperation. He has always been very active at the international level and collaborated with many research centres in Germany, Russia, France, China, Sweden, Slovakia, Czech Republic and Austria. Invited many times as visiting professor, he has delivered about 60 lectures at universities and over 300 papers at international conferences.

Josef has always been interested both in basic and applied chemistry. He published over 230 papers (most of them in international journals) and edited (or co-edited) about 10 books and conference proceedings, frequently used by young scientists and students. Prof. Ziółkowski has established a highly successful research program in the area of synthe-

sis and structural studies of transition metal complexes and their application to homogeneous catalysis by metal complexes. The main topics discussed in his publications concern important organic catalytic reactions such as oxidation of hydrocarbons (catalysed by cobalt complexes), epoxidation of olefins (catalysed by molybdenum complexes), olefin metathesis (tungsten carbonyl complexes have been found effective catalysts for photochemical metathesis of olefins) and particularly hydroformylation of olefins by homogeneous and heterogenised rhodium catalysts. He determined electronic structure of μ_3 oxo tricovalent acetate with paramagnetic mixed-valence core of formula $[\text{Co}_2^{(\text{III})} \text{Co}^{(\text{II})} \text{O}]^{6+}$ and its catalytic activity for oxidation of cyclic hydrocarbons. The above catalyst has found application to oxidation of *p*-xylene and cyclohexane on a commercial scale. Studies of binuclear Mo(V) complexes resulted in the development of very active and selective catalysts for epoxidation of olefins and decomposition of organic hydroperoxides. The synthesis of the new mixed-valence dimeric complex of rhodium with Rh(II)–Rh(III) (d^7 – d^6) core has enabled to demonstrate the shortest Rh–Rh bond as proved by X-ray studies of $[\text{Rh}_2(\text{CH}_3\text{CO}_2)_4(\text{H}_2\text{O})_2]\text{ClO}_4 \cdot \text{H}_2\text{O}$ complex. Catalytic properties of Rh(II) and Rh(III) complexes for hydroperoxide decomposition appeared to be dependent on the complex electronic structure. Several dozens of new rhodium(I) complexes with phosphine and phosphite ligands were obtained by Prof. Ziółkowski and his collaborators. Structures of these complexes were determined and they were used as precursors of catalysts for hydroformylation, hydrogenation and isomerisation reactions in organic and aqueous solvents as well as in heterogenised form after supporting them on mixed oxides or silica. The attractive properties of rhodium complexes with π -acceptor ligands like pyrrolylphosphines and phosphites have been demonstrated in hydroformylation reactions of mono-olefins, linear and cyclic dienes as well as allyl alcohol and unsaturated esters. The contribution of Prof. Ziółkowski to rhodium chemistry and catalysis is very significant – it makes about 100 papers and several patents.

His recent work has been directed toward palladium chemistry and catalysis, mainly the application of organopalladium catalysts to carbonylation of aryl halides. The catalytic palladium systems investigated by him are homogeneous and composed of monomolecular or colloidal palladium species. The

application of TEM, XRD and XPS techniques for studying palladium colloid interaction with substrates of the carbonylation reaction allowed identification of active intermediates and propose the reaction mechanism.

Josef is also involved in applied studies related to environmental problems like the elimination of SO₂ from industrial waste gases via absorption in polyethers or the removal of NO_x from sulphuric acid on commercial scale.

Prof. Ziółkowski has achieved a significant international position among researchers involved in studies of coordination chemistry and catalysis. High appreciation of his professional activities resulted in electing or appointing him to different international bodies like the International Organizing Committee of ICCA (since 1970), Advisory Board of the International Symposia on Homogeneous Catalysis (till 1997) and recently (2001) Advisory Board of the International Symposium on Relations between Homogeneous and Heterogeneous Catalysis.

Prof. Ziółkowski was awarded two international prestigious honours: honorary doctorate of St. Petersburg University (2000) and membership of Academia Europaea (2000). He also received a number of national awards from the Ministry of Higher Education (Warsaw), Polish Academy of Sciences (Marie Curie Award) and Polish Chemical Society. His other awards include National Education Commission Medal, Cross of Merit, Chevalier's Cross, Officer's Cross and Commander's Cross of the Order "*Polonia Restituta*".

Very important part of Josef's activities both in national and international areas was the organisation of 15 Summer Schools on Coordination Chemistry (the first of them in 1964, the last one in 2004). These activities as well as the coordination of two *Tempus* projects (1991–1993 and 1994–1997) allowed to bring to Poland a great number of outstanding specialists in coordination and environmental chemistry as well as in catalysis which stimulated education and the develop-

ment of staff at Polish universities and promoted international cooperation in the field of science and education.

Prof. Ziółkowski supervised 15 doctoral theses and several of his former students became eminent scientists – three of them received Doctor Habilitatus degree and two are full professors.

In addition to his research and teaching activities, Josef has accepted many tasks in the science management and organisation at the University of Wrocław. He was Head of Inorganic Chemistry Department (since 1980), Director of the Institute of Chemistry (1982–1987 and 1993–1995), Dean of the Faculty of Chemistry (1995–1999) and vice-Rector of the University (1987–1993 and 1999–2002).

He has always had a very stimulating and inspiring influence on students, young scientists and his colleagues. Being enthusiastic and very creative person, he is able to attract people for realisation of his ideas not only in research, but also in many other fields including science management. His criticism during scientific discussions has taught us to be accurate and careful in the interpretation of experimental results.

Together with the authors of papers submitted to this special issue, we would like to congratulate Prof. Ziółkowski on his outstanding achievements in chemistry and wish him good health and continuing success in catalysis and coordination chemistry.

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