



LUIGI SACCONI

Introduction

Professor Luigi Sacconi retired at the end of 1986 and this special issue is a tribute by the international scientific community to his outstanding contributions to organometallic chemistry. Professor Sacconi was the founder of a flourishing school and many of his former students have achieved international reputations in prominent positions in Italian universities and research institutions. Born in 1911 in S. Croce sull'Arno, near Pisa, Prof. Sacconi took his degree at the University of Firenze in 1942. He was appointed professor of General and Inorganic Chemistry in Palermo in 1954, and moved to Firenze in 1960, where, from 1968 to 1981, he also directed the Istituto per lo Studio della Stereochimica ed Energetica dei Composti di Coordinazione del Consiglio Nazionale delle Ricerche.

Politically engaged in the fight against Fascism, it was not until 1946 that he could devote himself entirely to research, and he then brought to this activity the same enthusiasm and endurance he had shown in the political arena.

Of the major scientific achievements of Professor Sacconi and his coworkers we first consider the early studies on the origin of paramagnetism of complexes of nickel(II) with Schiff's bases, in which it was demonstrated that tetrahedral species are responsible for the paramagnetism. Professor Sacconi also prepared and characterized several uranium(IV) and UO_2 - β -diketonate complexes, and showed for the first time that the coordination number of uranyl is higher than six. Remarkable results were also obtained in studies on the thermodynamics of complex formation. Equilibria between the acceptor complex diacetyl-bisbenzylhydrazinonickel(II) and various series of amines and phosphines were studied. With the aid of a specially designed calorimeter he was able to show that the thermodynamic parameters for complex formation between $3d$ bivalent metals and polyamines could be determined, and thus throw light on the problem of the "chelate effect". Another successful activity involved studies of the coordination geometry of transition metal complexes. Using a large number of techniques Professor Sacconi succeeded in clarifying the relationship between the electronic and steric properties of ligands and their ability to form pentacoordinate complexes. As a consequence of these studies pentacoordination became no longer considered unusual. Geometric distortions and spin states of pentacoordinated metal complexes were explained in terms of the geometric configuration imposed by ligands and of the electronic properties of the donor atoms. More recently Professor Sacconi's studies have been devoted to the synthesis and characterization of $3d$ metal complexes containing tripod-like polytertiary phosphines and arsines. These ligands are able to stabilize unusual oxidation states of metals and to lead to unexpected geometries and coordination numbers. Several pentacoordinate and tetrahedral complexes of nickel(I), nickel(0), cobalt(I) and cobalt(0) were prepared and a trigonal pyramid geometry was observed in some nickel and cobalt complexes. Non-stoichiometric hydride complexes were also described.

Professor Sacconi also showed that tripod-like ligands can promote a number of unexpected reactions, such as phenylation with BPh_4^- , esterification, CO insertion, formation of thio complexes and so on. It is noteworthy that new cyclotriphosphorus and cyclotriarsenic units, P_3 and As_3 were synthesized by reaction of white phosphorus and yellow arsenic with hydrated salts of nickel(II) and cobalt(II). Double sandwich monomeric complexes of cobalt, nickel, rhodium and iridium were also obtained. Some of these provide the first examples of double sandwich paramagnetic complexes. A nickel(0) complex, containing a tetrahedral P_4 molecule σ -bonded to the metal was reported recently.

Professor Sacconi is the author of more than 250 scientific papers. Many scientists from all over the world have benefitted from his scientific guidance during their stay in Firenze. Professor Sacconi has received many honours for his research activity. He is a member of the Accademia Nazionale dei Lincei and a recipient of the Gold Medal of the Società Chimica Italiana and Ministero della Pubblica Istruzione. He was an invited speaker at many international scientific meetings. He is and has always been a firm believer in the relevance of scientific culture for the advancement of mankind. We are all indebted to him for his teaching, and wish him many more years of fruitful scientific activity.

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