

Preface

It is a particular pleasure to create this special issue of *Coordination Chemistry Reviews* to honour Professor Ronald J. Gillespie who celebrated his 75th birthday in 1999. Ronald Gillespie, still scientifically very active, has provided many seminal contributions to the development of inorganic chemistry during his long and very successful career. As a consequence, many of his friends and colleagues have come together in this issue to paint a picture of his life and to show how their scientific growth and originality have relied on his fundamental contributions. It is very evident from reading these contributions how profound an effect Ronald Gillespie has had.



Photo: Professor Ronald J. Gillespie

As measured by its early adoption into the undergraduate teaching curriculum, and the ease with which it can be understood and employed, the Valence Shell Electron Pair Repulsion Model (VSEPR), of all of Ron's work, has surely made the greatest impact on the largest number of researchers. The theory was introduced in 1957 in a publication in the *Quarterly Reviews of the Chemical Society*, co-authored with Sir Ronald Nyholm, an outstanding Australian inorganic chemist whose influential

contributions were tragically cut short by an early death. Gillespie and Nyholm were both on the staff of University College London at that time. Professor Gillespie's current development, the ligand close packing model, also promises to change the way in which chemists think about chemical bonding, e.g. is BF_3 better described as a mainly ionic rather than mainly covalent molecule?

The first article written by Peter Robinson, a close personal friend and associate of some 45 years standing, portrays Ron's career path and his achievements in some detail. It illustrates his primary contributions in the fields of Superacid Chemistry, Polyatomic Non-Metal Cations, Noble Gas Cations, the VSEPR theory and its development into the Ligand Close-Packing Model. This article also reinforces the view that Ron is not only an inspired researcher but also a very dedicated and enthusiastic teacher. The second article by István Hargittai provides a second distinctive snapshot, different in emphasis from that of Peter Robinson, of Ron's life seen from his perspective also as a long standing co-worker. Larry Bartell contributes the third article and in characteristic style shows how he and Ron Gillespie have been 'sparring' over VSEPR and Ligand Close Packing models culminating, as Professor Bartell puts it, with Professor Gillespie becoming a strong advocate and developer of the Ligand Close Packing model which was, in fact, employed many years ago by Professor Bartell (but with a much narrower perspective than now employed by Gillespie), and Professor Bartell now becoming a devotee of the VSEPR model.

The fourth Chapter in this volume, written by Ron Gillespie himself, discusses how this elegant VSEPR theory is complemented by his more modern Ligand Close Packing model incorporating the electron density distribution. There follows three articles by Richard Bader, Anthony Downs and Sean McGrady, and Andrew Streitwieser illustrating various aspects of chemical bonding and dynamics. The Bader article especially illustrates the interplay of ideas between the author and Ron Gillespie in the development of the models, while the Downs and McGrady paper pushes the VSEPR envelope by looking at apparent exceptions. The Streitwieser paper explores the thermodynamics of binding of the deceptively simple molecular interactions between water and ammonia and the alkali metal cations

These are followed by two Chapters with a topological bias by Bruce King and Paul Popelier. Various bonding problems in some organometallic species are then addressed in the following three Chapters by Andrew Hughes and Ken Wade, Tony Legon and Gernot Frenking.

With Rüdiger Mews we delve into the chemistry of complexes containing sulfur dioxide as a ligand, as well as reactions in that medium. Next we pass to Noble Gas species with articles by Nobel Laureate Neil Bartlett, and Gary Schrobilgen, the latter focusing on their NMR characteristics. Jack Passmore then closes the volume with an extensive Chapter on homopolyatomic ions.

The diversity of topics in this volume is also a tribute to the breadth and influence of Professor Gillespie's career. We all owe him a great debt of thanks. On a personal note, I have known Ron for some 40 years and it is a personal pleasure to have put together this Issue and to acknowledge that I, too, owe him so much in the development of my own teaching of bonding theory.

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