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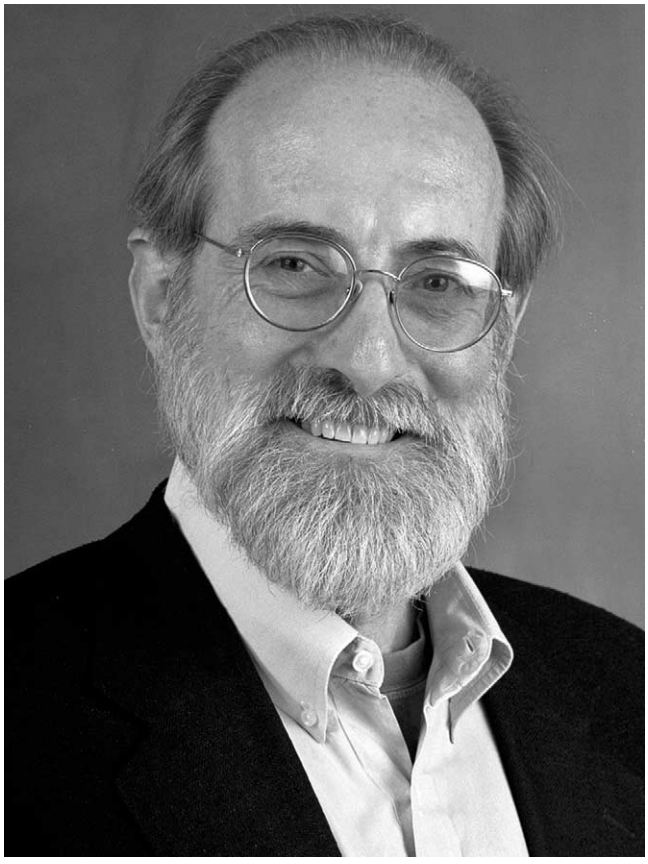
Preface

Honoring Professor Jerry L. Atwood



This commemorative volume of the *Journal of Organometallic Chemistry* is dedicated to Professor Jerry L. Atwood, Curator's Professor of Chemistry at the University of Missouri-Columbia, on the occasion of his 60th birthday. To those most familiar with Jerry a number of descriptions come to mind including piercingly insightful, elegantly perceptive, and gracefully intuitive (in addition to fun-loving). Although these terms are both complementary and complimentary, they fail to accurately capture more than a small segment of our good friend. The scientific interests of Jerry are as diverse as they are finely focused ranging from fundamental organometallic chemistry, to host–guest chemistry, to the burgeoning field of supramolecular chemistry. In an effort to celebrate this most exceptional scientist on this auspicious occasion, many of his friends, colleagues, and former students have chosen to honor him through their contributions to this commemorative issue of the *Journal of Organometallic Chemistry*.

Jerry L. Atwood was born on 27 July 1942 to Harvey and Louise Atwood in Willard, Missouri. His childhood could be described as uneventful to the point of being boringly normal. Ever competitive, Jerry's exceptional height and great natural athletic ability coupled to make him an outstanding basketball player. He graduated from high school in 1960 and attended Southwest Missouri State University in Springfield, Missouri. Demonstrating an aptitude for science and mathematics Jerry obtained a B.S. in Chemistry and Mathematics in 1964.

Having decided to pursue graduate studies with an emphasis on inorganic chemistry Jerry chose the outstanding program at the University of Illinois at Champaign–Urbana and worked under the supervision of Professor Galen Stucky. His first research publication [*J. Am. Chem. Soc.* 89 (1967) 5362], entitled "The Crystal and Molecular Structure of $[Al(CH_3)_3]_2 \cdot C_4H_8O_2$", concerned the interaction of the Lewis acid trimethylaluminum with *p*-dioxane, a Lewis base. This

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fascination with Group 13 Lewis acids would prove to be a dominant theme in Jerry's research program. Professor Stucky still speaks affectionately of Jerry even as he recalls being a young assistant professor and once watching (safely from a distance in the laboratory) as his fearless graduate student "fished out" some crystals from a pyrophoric aluminum alkyl solution. After four very productive years as a graduate student at the University of Illinois at Champaign–Urbana, he obtained his Ph.D. in 1968.

Jerry arrived at The University of Alabama in the fall of 1968 prepared to begin what would prove to be a brilliant academic career. His first major scientific breakthrough, liquid clathrates, was made shortly thereafter. At the time, clathrate compounds were traditionally taken to be solid-state hosts. He employed the term 'liquid clathrates' to describe a system of liquid host substances, based upon aluminum alkyls, wherein aromatic guests (benzene, toluene, ethylbenzene, etc) could be 'held' and ultimately delivered unchanged. The first paper on this subject, entitled "Solid-State Structure and Solution Behavior of Compounds of the Type $M[Al_2(CH_3)_6X]$", was appropriately published in the *Journal of Organometallic Chemistry* [42 (1972) C77]. The field of liquid clathrates was further defined and refined in an extended series of studies from the Atwood laboratory in the 1970s and 1980s. A particularly important discovery related to liquid clathrates was made in 1987 concerning the stabilization of the H_3O^+ cation in aromatic solvents [*J. Am. Chem. Soc.* 109 (1987) 8100]. The liquid clathrate field remains active as evidenced by the fact that a number of patents on these substances have been issued in recent years.

In the early 1970s Jerry synthesized and structurally characterized a range of early transition metal, lanthanide, and actinide compounds exhibiting metal–carbon σ-bonds. During this period of organometallic chemistry an important question was the extent to which such bonds possessed covalent character. Jerry also contributed to the study of organoscandium chemistry with the synthesis and molecular structure of $[Cp_2ScCl]_2$ [*J. Chem. Soc. Chem. Commun.* (1972) 593].

In the early 1990s high-oxygen content organoaluminum compounds, specifically aluminoxanes, attracted Jerry's attention. Aluminoxanes, compounds prepared by the reaction of water with aluminum alkyls, are the industrial co-catalysts of choice for the polymerization of olefins by metallocenes. A high-oxygen content organoaluminum anion, $[Al_7O_6(CH_3)_{16}]^-$, prepared in the Atwood laboratory is regarded by some as a model for the active species in commercial methylalumoxane, MAO [*Organometallics* 2 (1983) 985].

Jerry has made a number of seminal contributions to the field of calixarenes. His first article in this area described the interaction of trimethylaluminum with calix[4]arene [*J. Am. Chem.* 108 (1986) 1709]. With this study Jerry's research interests entered the realm of supramolecular chemistry. Of particular note are three other studies: (1) the characterization of the $O–H\cdots\pi$ interaction involving water in the cavity of a calix[4]arene [*Nature* 349 (1991) 683]; (2) the discovery of a facile separation process for fullerenes via calixarenes [*Nature* 368 (1994) 229]; and (3) the selective binding of anions within the cavities of metallated calixarenes [*Angew. Chem. Int. Ed. Engl.* 33 (1994) 2456].

At this point in his career Jerry had facilely risen through the academic ranks attaining the title of Research Professor at The University of Alabama in 1987. His research interests were now firmly focused on the field of supramolecular chemistry. In 1994 the University of Missouri was ultimately successful in luring Jerry from The University of Alabama to serve as Professor and Chair of the Department of Chemistry.

In 1997 the Atwood laboratory discovered a chiral spherical molecular assembly stabilized by sixty hydrogen bonds [*Nature* 389 (1997) 469]. This work quickly led to a general strategy for the design of very large, spherical molecular capsules based on the geometrical principles of Plato and Archimedes [*Angew. Chem. Int. Ed. Engl.* 38 (1999) 1018]. Consequently, it is now possible to prepare large supramolecular assemblies by design from simple building blocks. Another significant discovery in this area was the control over geometry, sphere or tubule, dictated by simple control of reagent stoichiometry. For the first time, the same components could be formed into a sphere or a 'molecular capsule' by design [*Science* 285 (1999) 1049]. As part of a general program aimed at discerning the details of the interaction of 'ordered water clusters' with hydrophobic entities, Jerry has prepared compounds containing water monomers, dimers, trimers [*J. Am. Chem. Soc.* 119 (1997) 2592], octamers, and decamers [*Nature* 393 (1998) 671].

With nine patents, almost 600 research publications, countless seminars and conference presentations, it is obvious that Jerry L. Atwood is one of the truly great practitioners of chemistry. Jerry has a unique ability of not only 'seeing the big picture' relative to science, but he also sees the wall upon which the picture will be hanging, the building which will house the picture, and the tree lined street where the building will reside. Although it is difficult to comprehend, we have a feeling that the best is yet to come.

Gregory H. Robinson
Department of Chemistry
The University of Georgia
Athens, GA 30602-2556
USA
E-mail address: robinson@chem.uga.edu