

The Fullerenes Group

by
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Our Featured Group

The feature articles appearing in this issue give a flavor of the current state of fullerene research in three important areas: medicinal research, light harvesting with functionalized fullerenes, and carbon nanotubes. These articles also provide bridges for possible interactions with other Divisions of the Society.

Carbon materials play an important role in our everyday life. Carbon microparticles are employed in many common commodities: paints, inks, polymers, high performance composites, and the like. Fullerene materials (C_{60} , C_{70} , C_{76} , C_{78} , etc.) constitute a new phase of carbon with distinctly different phase transition and electronic properties. In contrast to graphite (a good conductor) and diamond (an insulator), fullerenes are semiconductors that are soluble in nonpolar solvents and chemically behave like organic molecules. Their ability to reversibly add six electrons in successive one-electron transfer steps, as well as their ability to act as an electron relay and to generate long-lived excited states, have made them an important class of compounds. What started off a decade ago as a simple curiosity to study a "buckyball" (a caged spherical molecule containing five- and six-membered rings with significant electron density), has now grown into a full-fledged research field. Novel molecules with unusual physical and chemical properties are being synthesized from C_{60} or C_{60} -like molecules.

Carbon nanotubes are another class of interesting carbon nanomaterials because their closed ends can be opened by reacting with mild oxidants and then filled with metals. The steady increase in the number of published papers involving fullerenes (see Fig. 1) is testimony to the continuing health of this interdisciplinary field. Clearly, fullerene research has many surprises and applications in store.

The Fullerenes Group of the Society was officially formed in October 1993 after conducting a successful symposium at the 180th Society meeting in Phoenix, Arizona, in the fall of 1991. The Group has since grown to include a solid and enthusiastic array of scientists

Fullerenes



(continued on page 40)

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(continued from page 23)

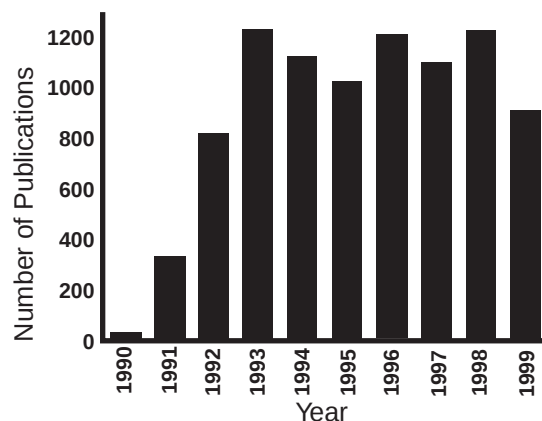


Fig. 1. The number of publications related to fullerene research. (Compiled from the database of Web of Science, Institute of Scientific Information.)

working in all areas of chemistry, physics, materials science and engineering, many of whom are now looking forward to having the Fullerenes Group attain Division status within ECS in the not-too-distant future.

One major activity of the Fullerenes Group is to arrange symposia at the ECS spring and/or fall meetings. Joint symposia are also held with other Divisions. Examples of Fullerenes Group symposia

topics include electrochemistry and ESR, fullerene functionalization and biochemistry, photophysics and photochemistry, thermodynamics and mass spectroscopy, nanotubes and nanocarbons, solid-state physics, theory, and endofullerenes. These symposia have attracted researchers from not only the U. S. but also from all over Europe and Asia. A total of seven ECS proceeding volumes have been published by the

Fullerenes Group, all of which have the same series title, "Recent Advances in the Chemistry and Physics of Fullerenes and Related Materials." These serve as desk references in many laboratories worldwide. Finally, it should be pointed out that an important component of the success of the Fullerenes Group resides in the dedicated efforts of its many symposium organizers and Fullerenes Group officers. ■

Fullerenes Group Future Symposia Plans Toronto — May 2000

Nanostructured Materials in Electrochemistry and Photoelectrochemistry (co-sponsored by the Energy Technology Division); *Fullerenes, Nanotubes and Carbon Nanoclusters*: (Fullerenes in the Undergraduate Curriculum; Electrochemistry and ESR; Photoinduced Processes; Functionalized Fullerenes; Nanotubes and Nanostructured Materials; Energetics and Structure of Fullerenes; Endofullerenes and Carbon Nanocapsules; Solid-State Physics; Biochemical and Pharmaceutical aspects of Fullerene Materials).

Phoenix — October 2000

Applications for Fullerene Materials for Batteries and Fuel Cells (co-sponsored by the Battery Division).

About the Authors

Karl M. Kadish is Professor of Chemistry at the University of Houston and Chairman of the Fullerenes Group. His research interests include analytical chemistry, electrochemistry, porphyrin chemistry, and fullerene chemistry. In 1995, Dr. Kadish was elected as a Fellow of The Electrochemical Society. He is one of the founders of the Fullerenes Group and has co-organized symposia at ECS meetings since 1991. He has published over 325 research papers. (e-mail: Kadish@jetson.uh.edu).

Prashant V. Kamat is a Senior Scientist at Notre Dame Radiation Laboratory and Vice Chairman of the Fullerenes Group. His research interests include charge transfer processes in nanoscopic materials, photoelectrochemistry, photo and radiation induced catalysis, solar energy conversion and environmental remediation. He has conducted several symposia at ECS meetings and is the author of more than 225 research papers. (e-mail: Pkamat@nd.edu).