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## Editorial

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Over the last decade, there have been significant developments in the science of fullerenes. Fullerenes are now available in multigram quantities and, following the first preparation in 1990 in the laboratories of Krätschmer and Huffman, the development of these new carbon allotropes has moved from an initial period devoted to the assessment of the basic chemical reactivity, particularly the most abundant C<sub>60</sub> molecule, to the preparation of a myriad novel fullerene derivatives, in the search for new properties in diverse areas such as medicinal chemistry and materials science.

The unabated interest in the fullerenes has surpassed the frontiers of chemistry and physics, such that fullerene science and technology has become a true interdisciplinary area. For instance, photoinduced electron and energy transfer processes of new C<sub>60</sub>-based dyads, triads and polyads; the chemical modification of carbon nanotubes or the supramolecular chemistry are currently among the most exciting topics under intense study in fullerene-related science.

As predicted by François Diederich (*Chem. Eng. News*, 1993, **22**, 8) the chemistry of fullerenes can be considered nowadays a well established science. Therefore, it is time to find an answer to the frequently asked question of practical applications of fullerenes. At this stage, we can safely affirm that the photovoltaic properties, first discovered by Sariciftci, Wudl and Heeger in 1993, are among the most outstanding and realistic applications of fullerenes. Photovoltaic cells that exhibit remarkable energy conversion efficiencies, prepared from C<sub>60</sub> and semiconducting polymers, have been constructed.

Application of fullerene derivatives in fields such as optical limiting, liquid crystals, photosensitisers represent other important examples where fullerenes are being currently thoroughly investigated with practical purposes.

The state of the art of fullerenes well deserves this timely compilation of articles in this special issue of the *Journal of Materials Chemistry*, where the most relevant topics focussed on the preparation of modified fullerenes with application in materials science have been gathered. A series of authoritative Feature Articles are also included, giving a general overview of the different fields of materials science. A general account of fullerene materials is given by Fred Wudl, whereas the most promising fields of application have been reviewed by A. Cravino and N. S. Sariciftci (organic solar cells), R. Deschenaux (liquid crystals), D.M. Guldi and N. Martín (supramolecular chemistry) G. Brusatin and R. Signorini (NLO properties in solid matrices). A review on the covalent chemistry of carbon nanotubes by J. M. Tour and J. L. Bahr describes the most recent achievements in this closely related and emerging field of research.

The different topics currently under investigation in many laboratories spread all over the world are collected in regular articles, which constitute a real indication of the progress of fullerenes in Materials Chemistry. Therefore, different contributions dealing with the chemical reactivity of fullerenes, some of them unravelling new mechanistic aspects or electrochemical methods are collected here. A relevant number of contributions on photoinduced electron and energy transfer studies on C<sub>60</sub>-based donor–acceptor systems and also on supramolecular aspects of fullerenes reveal the current interest and competition in these fields.

Fullerenes have almost come of age since they were discovered by Curl, Kroto, Smalley and collaborators in 1985. Therefore, they possess the youth and, at the same time, the maturity to receive attention of scientists interested in the development of new reactions and new concepts involving fullerenes, or those aiming at reaching practical applications.

All the articles contained in this issue have been written by prominent colleagues. The guest editors would like to thank them all for their collaboration and efforts to achieve this—hopefully—successful goal. We are sure that the readers will appreciate the interesting aspects and the top quality of the articles collected on these fascinating carbon molecules. Finally, our gratitude is extended to the Scientific Editor of the *Journal of Materials Chemistry*, Professor Peter Day, the former Editor, Professor Martin Bryce, and The Royal Society of Chemistry, in the person of Dr Robert D. Eagling, for their support and interest in this pleasant enterprise.

**Maurizio Prato and Nazario Martín**