

Preface

Organometallic chemistry of fullerenes

Polyhedral carbon clusters known as fullerenes, discovered in 1985, are among the most uncommon man-made chemical compounds. They became available in large amounts sufficient for chemical work after 1990, when a practical method for their preparation in an electric arc and their isolation from the resulting soot had been developed. Fullerene is a term used for the whole family of individual three-dimensional molecules that can be considered as a 'collective' allotropic form of carbon. They have an ellipsoidal shape with an inner cavity large enough to host one or more atoms. Such unprecedented inclusion complexes with a unique topology called endohedral have been obtained for a number of metals and rare gases.

During the last decade many aspects of fullerene reactivity have been studied. The lowest stable member of the family, C_{60} , is the most available and investigated fullerene. On the whole fullerenes behave as electron-deficient strained polyalkenes and the broad organic chemistry of fullerenes has been developed. They have inter alia a strong tendency for adding electrons, nucleophiles and free radicals as well as taking part in many cycloaddition reactions as the 'ene' partner. A very remarkable feature is the cleavage of a single carbon-carbon bond in reaction with diazo com-

pounds, leading to a new structural type called fulleroid.

The ability of fullerenes to coordinate transition metals was recognized early on in their development. The first η^2 -metal(platinum) fullerene complexes were synthesized in 1992. Later many other metals were complexed to fullerenes but in the same fashion. Coordination with different hapticity has not yet been observed. Endohedral metallofullerenes represent a special chapter of organometallic fullerenes. Until now, they are available only in very small amounts and little chemical synthetic work has been done. On the eve of the year 2000, the situation with endohedral metallofullerenes is similar to that with 'empty' fullerenes before 1990.

It happened that just a few papers on organometallic fullerenes had been previously published in this journal, which seems to be the natural place to accept them. It was decided to organize this special issue in order to collect a number of papers on the organometallic chemistry of fullerenes including endohedral metallofullerenes and thus to incorporate this area into the general context of organometallic chemistry.

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