Abstract

Within the field of organic synthesis, ***organometallic chemistry*** *can be consider a bridge between classical organic chemistry and inorganic chemistry, since it generally studies the interaction between "inorganic" metals and organic ligands. This subarea has had a vertiginous growth in last the three decades, since the study of the compounds that contain metal-carbon connections, has made possible the development and optimization of numerous industrially important processes such as the design of catalysts, or the industrial synthesis of active principles in drugs. Furthermore, new processes are continuously being developed.*

From the time of the discovery of [methoxybenzilidene pentacarbonyl] chromium(0) in 1964 by Fischer and Maasböl, many studies have been developed around the chemistry of these transition metal carbene complexes. Its utility generally includes their use as an important building block for different molecules with particular interest.

On the other hand, ***physical organic chemistry****, as an investigation area, results as a symbiosis between organic and physical chemistry, including of tools such as the chemical equilibrium, kinetic chemistry, thermochemistry and quantum chemistry on phenomena of classic organic chemistry.*

This PhD thesis, includes studies on these vast working areas. As a means of introduction, the first two chapters expose the antecedents related to the reactive behavior of the studied molecules. In chapters from the 3 to 6 the results obtained in the study about the reactivity of unsaturated Fischer carbene complexes with sulphur nucleophiles and the physico-chemical properties of dithiafulvene heterocycles are described. Each chapter contains a brief description of the specific relevant antecedents described in the bibliography, the particular objectives of the subject, the description of the results obtained and the corresponding conclusions. At the end of each one of the chapters, a detailed description of the experiences carried out and the structural characterization of the new molecules obtained. Chapter 7 of the thesis, describes the general conclusions of the work and the projections that came off from the results obtained. Finally, the Appendixes include the synthetic methods for obtaining the substrates used and the ^{13}C nuclear magnetic resonance spectra of new compounds.