

Preface

Stable nitroxides attract the growing interest of researchers since they are characterised by paramagnetism, which is a unique property in organic compounds. Due to it they show peculiar chemical and spectral behaviour making it possible to extend the highly sensitive and informative ESR method to molecular biology and analytical chemistry. The development of their chemistry and analytical chemistry. The development of their chemistry and their combination with the chemistry of complex compounds will obviously lead to compounds with currently unknown electrophysical properties. The general number of publications referring to nitroxides was 2000 in 1980 and kept on steadily growing. Their growth trend will persist in the future due to the usefulness of nitroxides in such fields as medicine, pharmacology, ecology and forensic chemistry.

Synthetic and physical chemistry of nitroxides, problems of their structure and reactivity, the theory and practice of molecular motion studies have developed at the interdisciplinary level between various sciences: molecular biology, biophysics, chemical kinetics, analytical chemistry, the chemistry of metal complexes, polymers, composite substances and other fields. The theory and applications of the chemistry of nitroxides were considered in the reviews and monographs of conference participants which served as a basis for their plenary lectures. The papers presented here report the essence of plenary lectures and contain the latest achievements in the field of nitroxide chemistry and applications. Since the international Symposium on Nitroxides in Pech, Hungary, in May 1979 (others were in Finland, 1981, USSR, 1982, and Canada, 1982 and 1989) this the second meeting to gather such a representative audience reflecting the main trends in this field. During these years, the synthetic chemistry of nitroxides grew sharply to provide new applications, including the use of pH-sensitive spin labels and probes. There was extensive research on possible applications of nitroxides in the ESR and NMR tomography, studies of conformational transitions, oxygen determination, protein coagulation, etc. It is especially worthwhile to note the creation of the chemistry of polyfluorinated nitroxides and the use of oxammonium salts for rather mild and selective oxidation. It proved efficient to use nitroxides to determine the radicals formed in foodstuff under γ -irradiation. Also, the use of nitrones for trapping and recording short-lived radicals was extensively developed.

On the whole, the papers presented here characterise rather fully the modern state and prospects for the development of the chemistry of nitroxides, including the most important trends of their application in science and practice. The International Conference on Nitroxides held in Novosibirsk will certainly promote the purposeful development of this field and will attract the attention of many chemist, physicists, biologists, engineers, physicians and specialists in other fields

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