

Preface

This book is written by a group of authors who have already cooperated for many decades. The successful combination of the scientific approaches of biologists interested in modern methods of physics and physical chemistry with those of physicists and experts in the electronics fields, who have developed new methods of derivative and EPR spectroscopy, has enabled the technical realization – with Russian equipment – of Prof. Ernest Rutherford's ideas about derivative spectra registration.

Years ago some members of this group of authors – for the first time in Russia (USSR) – used activation with protons and alpha particles for the detection of the stable oxygen isotope O^{18} incorporated in biologically active substances from labelled water molecules. These results are unique to date. The authors of the book have worked with great thoroughness in these fields for many years. One stage of the above-mentioned work was the development of radiochemical purification bases for use in biochemical preparations. These experiments required great application throughout decades by these authors, when their interests extended beyond radiation and spectroscopic research, as covered in one of book's chapters.

The book basically describes principles and practice of working with derivative spectrophotometry and EPR spectroscopy. The abundance of graphic material provides good visual perception of derivative spectra features and will help the reader to interpret his own experimental data from various scientific origins.

The authors freely cite Russian and European literature, and also publications from adjacent areas of the natural sciences less well known to the European reader. English literature is well covered, attention being paid to some debatable questions of biochemistry, the solution of which became possible due to the application of the research methods considered in the book.

The width of approach of the book's authors in various research directions concerned with the usage of diverse genetic material, with features of pigment metabolism of evolutionary forms of Eucaryota and Procaryota, and also with demonstration of practical application of derivative spectrophotometry for the assessment of states of biological objects under various anthropogenic and natural influences and in medical biochemistry, is impressive.

Material offered by authors and their interpretation of it is of doubtless interest to the wide audience of biologists, physicians, biophysicists, postgraduate students,

and students of biological, physical, chemical, and medical research profiles, and also to the ordinary inquisitive reader wishing to become familiar with features of the experimental work of biologists of physical and chemical areas and to widen his view of this interesting area of knowledge.

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Derivative Spectrophotometry and Electron Spin
Resonance (ESR) Spectroscopy for Ecological and
Biological Questions

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