The book is divided into five parts of almost equal importance.

The first part deals with some theoretical aspects of the interaction between radiation and matter, including coherent diffusion, diffraction, emission, and absorption. The second part provides an overview of the ways and means for generation, detection and measurement of X-rays, electrons, thermal neutrons and ions. In the third part, the treatment of diffraction covers classical methods (such as the powder methods) as well as elaborate ones such as crystal structure analysis. The fourth part focuses on radiation spectrometry: X-ray fluorescence spectrometry, microprobe analysis, surface analysis by emission spectrometry of photoelectrons and Auger electrons, absorption spectrometry of X-rays and energy loss of electrons, and emission spectrometry of secondary ions. The fifth part involves electron microscopy. It includes, in addition to conventional microscopy, recent technological techniques (e.g. scanning tunnelling microscopy) which achieve very high resolution.

The book provides the framework for the understanding of several methods of analysis, especially recent ones. The author avoids providing a great deal of introductory theory, but in every chapter refers to more specific papers and/or books dealing with the subject.

The author "goes to the facts themselves". He uses simple language to present elaborate concepts, and many illustrations, including photographs, are used throughout the text to facilitate understanding of the subject matter.

In addition to the five parts described, five appendices are provided. They are related either to theoretical aspects such as Fourier transform relationships, or to some practical aspects such as spectrometry data, or abbreviations and symbols.

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