This book is a compilation of papers presented at the 1964 Southern Metals/Materials Conference on Advances in Aerospace Materials, held April 16 and 17, 1964, at Orlando, Florida. All the papers are of excellent quality reflecting a well-planned and organized conference.

The purpose of the conference was “to identify materials processes and methods that show the greatest potential in future space technology and to define the gap between mission requirements and materials applications”. A review of the papers reveals that this objective has been fulfilled. The collection is presented in two parts: One part includes papers concerned with fundamental problems, and the other covers those related to applied research. Although there is no direct literary bridge between the fundamental and applied papers, they are more than usually complementary in subject matter.

Part I of the book is concerned with some of the more important fundamental factors that influence material properties. The relationship of grain boundaries to properties of ceramic materials, the characterization of defect structures and their influence on oxide materials, the effects of irradiation on molybdenum, and the role of dislocations in deformed beryllium are some of the timely subjects covered.

In Part II, some of the more advanced applied research work on materials is presented. All subject matter is of current importance and will be required reading for anyone interested in keeping abreast of this fast-moving technology. The papers cover such subjects as ductile chromium, formable sandwich structures, arc-cast tungsten, graphite-base refractory composites, glass microtape, and lightweight aerospace materials.

In summary, this second volume of Materials Science Research must be counted as one of the better editions of books that embody a series of papers presented at a technical conference. Full credit should go to its editors, who also were involved in organizing the technical program of the conference. The book is recommended for both engineers and scientists who have a strong interest in materials science and research.
mechanism of the scintillation process in organic materials (crystals, liquids, and plastics) and in inorganic crystals, particularly the alkali halides. Detailed consideration is given to those features of the scintillation process (in organics) that lead to a dependence of the scintillation efficiency on $dE/dx$ of the exciting particle (ionization quenching). The origin of the "slow" scintillation component in organic crystals is discussed in some detail, and several alternative theories are summarized. The treatment of the scintillation process in alkali halides is focused largely on effects responsible for the dependence of scintillation efficiency on ionization density. The experimental and theoretical situation is reviewed thoroughly, and Birks discusses the close analogy between the behavior of alkali halides and that of organic crystals.

Category (b), the "practice" of scintillation counting, accounts for most of the material in the book. The detection of scintillation events is treated in a chapter that considers the problems of light guides, photomultiplier spectral response functions, electron multiplication, the energy resolution of scintillators, and time resolution. Included is a comprehensive table giving the characteristics of almost 100 different photomultiplier tubes available from U.S. and European manufacturers. The various sources of line broadening in gamma-ray and charged-particle spectroscopy are considered, and the author gives a valuable critique on the effects responsible for the gamma-ray line width in NaI(Tl). Four chapters are devoted to the properties and applications of various organic crystals, liquids, and plastics, with liberal documentation in the form of tables and graphs. Gamma-ray spectroscopy with NaI(Tl) is treated in detail. Electronic instrumentation which follows the scintillation counter (i.e. from pre-amp to multi-channel analyzer) is not considered in this book.

In summary, this volume will undoubtedly serve as a standard reference and source book for those engaged in the development or use of the scintillation method. Fortunately, the delay between writing and publication has been minimized; references to the 1963 literature are included. Although it is not directed primarily to students, the book is written in a lucid manner permitting the nonspecialist to read, profitably, sections of interest to him. It might also be noted that the study of the scintillation process per se provides a valuable insight into many aspects of the interaction of radiations with matter and the subsequent transfer and dissipation of energy. Birks' book should, therefore, prove to be of considerable value to those interested in the general subjects of radiation physics and chemistry.

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