Book Reviews

Introduction to Radiochemistry. Gerhart Friedlander and Joseph W. Kennedy. New York: John Wiley; London: Chapman & Hall, 1949. 412 pp. $5.00.

Since its inception in the discovery by the Curies in 1898 that differences in chemical properties can be exploited to separate from pitchblende the two different radioactive elements polonium and radium, the field of radiochemistry has experienced an ever growing importance marked by two great accelerating discoveries—artificial radioactivity, in 1934, and nuclear fission, in 1939. It is now a popular and fertile province of research encompassing large territories of almost all branches of chemistry and of molecular, atomic, and nuclear physics, and even enjoys the ultimate mark of respectability: courses in radiochemistry are being offered by many of our universities.

The student of radiochemistry has long been without an adequate textbook, for the established references—the older works of Soddy; the classic treatises by Rutherford, by Meyer and von Schweidler, by Curie, and by Kohlrausch; the Cornell lectures of Hahn; and the admirable survey by Hevesy and Paneth—although still invaluable compendia of information on natural radioactivity, are all most severely dated. Friedlander and Kennedy have now filled this void with a fine and comprehensive book. Intended primarily for the student of chemistry, their volume should also prove extremely useful to students of physics, and to biologists, geologists, engineers, and others. It provides a modern, mainly descriptive, and simple though remarkably extensive account of radiochemistry and of much of nuclear physics as well. No previous knowledge of nuclear physics is demanded of the reader. Indeed, nuclear physics itself necessarily merits the greatest attention, and only some 60 out of 412 pages deal with essentially chemical matters. The selection of chemistry material is, incidentally just what should be acquired by any *physicist.*

The book is well written throughout and pleasantly free of errors. A great many references, fairly well organized, are included, and numerous skillfully contrived exercises, many with answers provided, enhance its value both for use in the classroom and for purposes of self-instruction. The figures are good, but no reproductions of cloud chamber photographs or photographic emulsion tracks are included—a regrettable omission in the reviewer's opinion, for such pictures, in addition to their scientific importance, have unique pedagogical value. Four appendices include useful reference data.

The appearance of this volume emphasizes the need for a modern laboratory manual, since a laboratory course in conjunction with lectures following this text should do much to complement and vivify the subject matter. It may also be remarked that the book is in no sense an advanced treatise, and the authors have wisely refrained from attempting to make it one. An advanced monograph on contemporary developments and problems in radiochemistry is sorely needed.

As an introductory text this excellent work by Friedlander and Kennedy can be highly recommended.

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The Transuranium Elements: Research Papers, 2 vols. Glenn T. Seaborg, Joseph J. Katz, and Winston M. Manning, Eds. New York: McGraw-Hill, 1949. 1733 pp. $15.00 a set.

The identification and first tracer chemical studies of a true transuranic element were announced in May, 1940; microgram amounts of pure solid compounds of a transuranium element were first prepared in August, 1942. The approximate deadline for much of the work included in this volume of the Plutonium Project Record is January 1, 1946, although some is more recent. The body of chemical and nuclear-chemical knowledge of neptunium, plutonium, americium, and curium contained in the 1,733 text pages of this book is impressive when it is viewed against this timetable.

The volume is important because, with a very few exceptions, it contains the sole scientific report of the chemistry of the transuranium elements written on the level of normal research journal publications that is available to the general body of scientists. It is fair to say that the detailed understanding of neptunium and plutonium achieved since May, 1940, as it is revealed here, approaches our present understanding of most common elements, and far exceeds the reliable information we have about many naturally occurring elements known to science for much longer periods of time.

As indicated, the book is a compilation of research papers which in the normal course of events would have seen journal publication. As would be true of any volume comprising all papers dealing with a single element or group of elements, *The Transuranium Elements* exhibits great unevenness. Notes such as are published in "Letters to the Editor," significant principally for historical reasons, are found side by side with papers as long as 45 printed pages, recording in detail work which was obviously pursued over a considerable period of time. Work that was involuntarily interrupted also contributes to the unevenness, as do the idiosyncrasies and varying degrees of experience of the many authors represented. Many of the papers meet the most exacting journal standards for concise clarity, but because of editorial choice and the absence of journal space limitations, the papers as a whole probably take more room than they otherwise might. In some cases this results in the reader's being given more information on important details than he might get in standard journal publications. One clear advantage this group of papers has over a compilation from normal journals is that errors