

Book review

Gmelin handbook of inorganic chemistry, 8th Edition, *Fr — Francium*, Springer-Verlag, Berlin, Heidelberg, New York, 1983, xi + 137 pages, DM 391.

This is the first volume on francium to appear in the Gmelin Handbook since the element was discovered by Marguerite Perey in 1939, although an appendix concerning the efforts to discover "ekacaesium" (Mendeleev's name of "dvicaesium" having been tacitly dropped) appeared in the 1938 "Caesium" volume. Francium is found naturally in uranium-containing minerals, and it is chastening to realise that at 560 g, this volume weighs 200 g more than the total estimated amount of francium existing naturally in the earth's crust. Indeed, francium is the least stable (and most electropositive) naturally occurring element on earth, its longest-lived isotope (^{223}Fr) having a half-life of 21.8 min. A consequence of this is that it is not possible to prepare the element or its compounds in weighable, or even visible, quantities, and the experimental work relies upon tracer chemistry. The only experimentally measured physical properties of francium compounds are the sublimation points of FrOH and FrCl , and most experiments use $<10^{-13}$ g of the element. Nearly all of the extensively tabulated data, concerning the physical and chemical properties of francium and its compounds, which are presented in this volume have thus been estimated theoretically, extrapolated from the properties of the stable Group IA elements.

The book contains, in addition to the obligatory (but fascinating) history of the search for and the discovery of francium, sections describing the natural occurrence of ^{223}Fr and ^{221}Fr , the nuclear properties of the thirty francium isotopes (^{201}Fr — ^{230}Fr , inclusive), the production and isolation of francium, the uses of francium (none discernable!), the analytical chemistry of francium, and finally the physical and chemical properties of francium (including its chemical behaviour in aqueous solution). The text (in English) is well illustrated, with an imaginative and helpful use of colour in the figures illustrating the decay series and the Karlsruhe Chart of Nuclides. (Why isn't colour used more extensively in the chemical literature of the '80's?). The volume is a work of scholarship (and, remarkably, the literature is complete to mid-1982) and, even at £0.714 per page, this is a vital addition to the chemical literature. The authors (S.H. Eberle, H.W. Kirby and H. Münzel) are to be congratulated upon a splendid achievement.