

Book review

Elsevier's Periodic Table of the Elements* (1987). Elsevier, Amsterdam

This colorful and neatly printed chart, sized 85×136 cm, presents some 48 chemical, physical, and other properties of chemical elements and atomic nuclei. It also tabulates SI units, conversion factors, physical constants, and fundamental particles. This wealth of data is packed densely in a well-organized way. A larger periodic table in the center, sized 29×56 cm, is surrounded by 21 smaller ones, 12 plots of properties versus atomic number, 9 plots of one property versus another, and several charts and tables, everything in SI units. Many useful facts can be found there, from the melting points and NMR receptivities to the abundances in solar photosphere and polymorphic transition temperatures. A single reviewer cannot check the accuracy of such a diversified collection, but the list of 90 references, which are cited throughout the chart, gives one confidence in the data.

Since this compilation is intended mainly for students and teachers, it will be judged also for its pedagogical value. Most of the tables and plots are clear and instructive, but some are not. One chart shows a sharp division of elements into metals and nonmetals, as if metalloids (or semimetals) did not exist. The diagram for the Aufbau principle is obscured with needless arrows. In the adjacent diagram of electron configurations (and elsewhere) the symbols s, p, d, and f should be termed subshells rather than orbitals because the tabulated maximum occupancy, $2(2l+1)$, is that of subshells rather than of orbitals. The maximum occupancy of shells is tabulated confusingly because it is not immediately clear what $2n^2$ refers to. Filling of the 5f subshell begins with Pa, not with Ac; on this point the small diagram of the quantum numbers is incorrect, but the main periodic table is correct. Elements in group 15 are called pnictogens, not pnictides; the latter term describes their ionic compounds. Some properties, such as the elemental abundances and the numbers of isotopes, are plotted versus the atomic number although no periodicity is evident there. While all the other charts have informative legends, the one about crystal lattices lacks such a caption.

This wall chart must be mounted carefully because even the central periodic table is too small to be read at a distance. The smallest plots, sized 5×6 cm, are like textbook figures. The captions are set in small print. Since the whole chart cannot hang at eye-height, the user will need to step close to it. Alternatively, the individual plots and tables can be cut out and kept in the drawer. Although it would be a pity to dismember a well-designed chart, it would be a practical way to keep this useful reference at hand.

N. M. Kostić, Ames

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