number can then be listed in brackets. For example, for γ-brass we would use *cI*(52) or *cI*(~52) for their cases.

The above scheme has two advantages. First, it shows clearly how the atoms are distributed among equivalent sites, and this will indicate relationships between compounds and pure elements, such as diamond and ZnS, or between intermetallic compounds, such as $Cu_5Zn_8$ and $Fe_3Zn_{10}$. Second, it points out quite clearly the difference between a "lattice of atoms," e.g., in Cu, and a structure. This is not a trivial point. Many respected textbooks on materials science refer to the "diamond lattice" or the "cph lattice" (e.g., Zn) and as one who teaches crystallography to materials science students, I find this causes considerable confusion. The modification proposed above to the Pearson symbol answers this problem, as may be seen by comparing the symbol for Cu with that for diamond, in the table above.

Above remarks by
**Hubert W. King**
Dalhousie University, Nova Scotia

* * *

After some years of preliminary work, Subcommittee 3 of Committee E-4 was established by ASTM in 1949 [1] with the task of formulating a nomenclature system for alloys which would be "brief, unambiguous, and usable" and "as simple as possible". After much work, a tentative standard, E157-61T, was issued in 1961 [2]. This committee specifically rejected proposals for more complicated nomenclatures that would have provided more information than strictly necessary. W. B. Pearson [3] replaced the single capital letter of E157 by a two-character mnemonic.

Professor Schubert is correct in pointing out that more detailed information can be supplied in more complex formulations. In conclusion, we have followed the ASTM committee in advocating a symbol that is as simple as possible, brief, unambiguous, and usable for ready classification and identification of crystal structures. For this purpose, the splitting of the number of atoms according to the different chemical components is undesirable and unnecessary. In particular, if the division is by lattice site, then the Schubert symbol could not be assigned until the structure is known, which is undesirable. Alternately, if the division is by chemical element, then for a solid solution series the Schubert symbol will change continuously across a phase field, whereas only one Pearson symbol is assigned to the entire field. Another advantage of the Pearson symbol is that it brings together binary and ternary phases of the same structure under the same symbol (e.g., ZrSiSe and $Cu_2Sb$ are both *tP*6).

Professor King's suggestion to append the Pearson symbol with site occupancy information is related to the proposal of Prof. Schubert. For the site occupancy information to be unique, a set of rules needs to be formulated, similar to the very complex rules proposed in NBS Monograph 134 [4]. We believe that the simplicity of the Pearson symbol is most appropriate for classification of crystal structures. When uniqueness is desired, we prefer to use the Pearson symbol and the representative formula of the prototype structure.

### References


1. W.L. Fink and L.L. Wyman, *Materials Research and Standards*, Vol. 1, p 289-290 (1961).
2. ASTM Standards, Note E157-61T, p 775-777 (1961).
3. W.B. Pearson, *Handbook of Lattice Spacings and Structures of Metals*, Pergamon Press, Oxford (1967).
4. W. Fischer, H. Burzlaff, E. Hellner, and J.D.H. Donnay, *Space Groups and Lattice Complexes*, NBS Monograph 134 (1973).


Above remarks by
**L.D. Calvert**
National Research Council of Canada

and

**C.R. Hubbard**
National Bureau of Standards, USA

We invite your comments on these or any other topics.
*—Editor*

# Addenda

## The Al-Sc (Aluminum-Scandium) System

On page 223 of Vol. 2, No. 2, the phase at 98 to 100 at.% Sc in the "Crystal Structures" table should be (βSc).