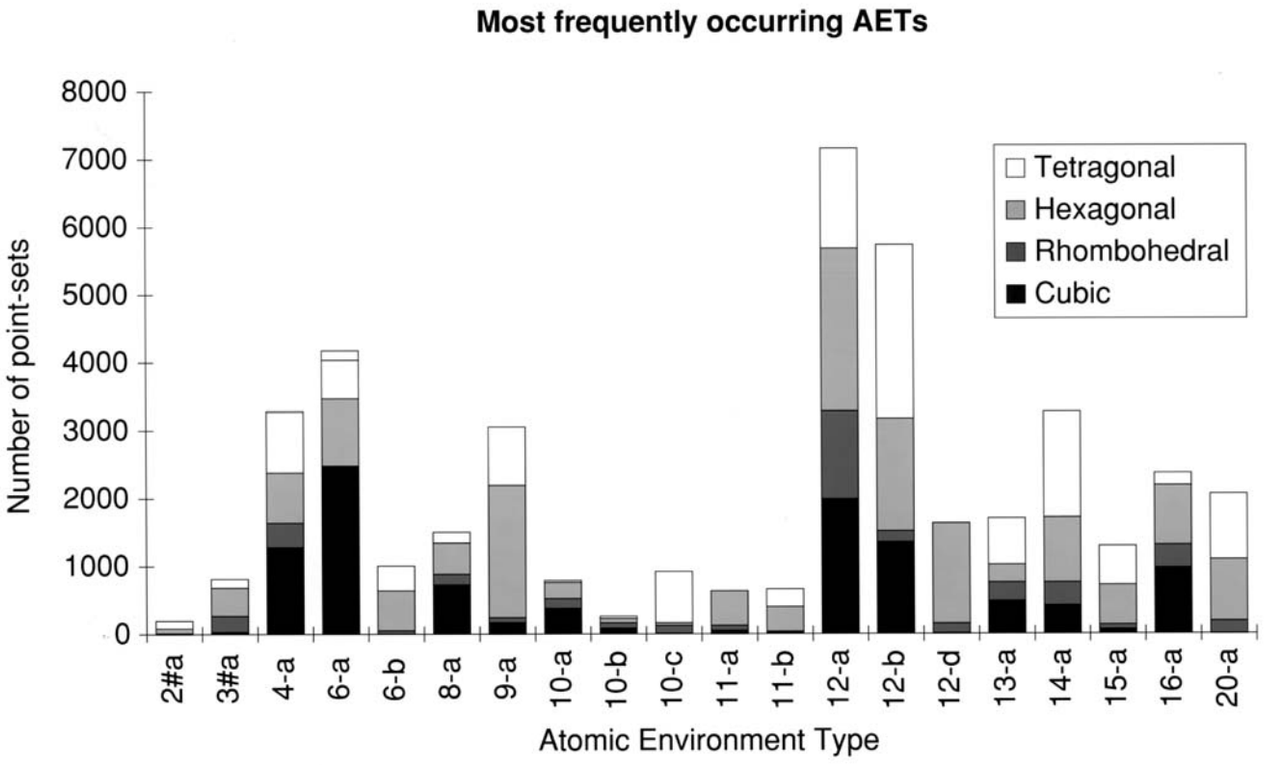

(*b*)

Fig. 9.3.4 (*cont.*)

systematic analysis shows that we have in general, especially for real intermetallic compounds, low coordination numbers, CN < 9, for the *p* elements, CN numbers between 9 and 14 for the *d* elements, and CN > 12 for the *s* and *f* elements. In structure types where we have covalent or ionic bonding, we observe much lower coordination numbers. For example, the atoms of the compounds crystallizing in *cF*8 ClNa have CN $= 6$, and they have the octahedron as an AE.

9.3.1. Glossary

Intermetallic compound: Intermetallic compounds are binary, ternary, quaternary, *etc*. compounds containing the chemical elements other than oxygen, the halides, and the noble gases. Also excluded are compounds containing typical inorganic groups like –NH, $-NH_2$, $-N_2$, *etc*. This definition was used for *Pearson's Handbook* (Villars & Calvert, 1991), the *Atlas of Crystal Structure Types* (Daams, Villars & van Vucht, 1991) and the CRYSTMET database (Rodgers & Villars, 1988). This definition therefore also includes sulfides, selenides, carbides, and nitrides, which most material scientists would not consider to be intermetallic compounds, but, because of their structural similarity, they have been included.

Structure type (or prototype): Based on space-group theory, a crystal structure is completely determined by the following data:

chemical formula;

crystal system and unit-cell dimension(s);

space group;

occupation number and coordination of the occupied point sets.

Crystal structure types are named by the first intermetallic compound found to be unique in respect of the third and fourth items and are represented by the Pearson symbol followed by the formula of the prototype, *e.g*. *hP*3 AlB_2. The first two letters of the Pearson symbol are identical to the Bravais-lattice type, and the digits give the number of atoms per unit cell.

references