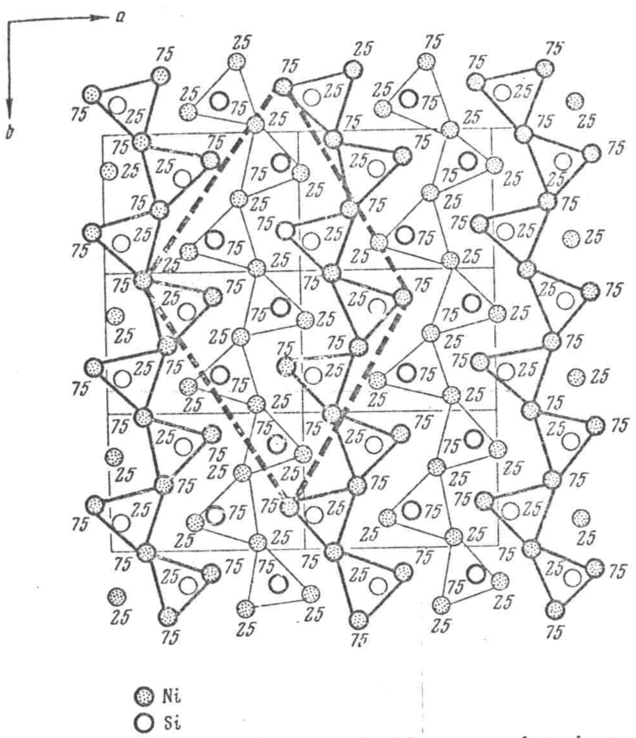

Fig. 1. Projection of the Ni_2Si (anti-$PbCl_2$) structure along the c axis in the Pbnm–D_{2h}^{16} aspect. The dashed lines are sections *a a* of the proposed hexagonal unit cell for Mg_2SnII; 25 is the coordinate z = 0.25 for the corresponding atom.

ature modification having the fluorite structure and the low-temperature form having the hexagonal structure mentioned above.

It is interesting that the $NaNdF_4$ structure is little different in essence from the hexagonal Fe_2P structure; they would be identical if we assume that Na atoms randomly occupying 2(h) positions in the $P\bar{6}$ group, 1/3, 2/3, z; 1/3, 3/2, $\bar{z}$ (z = 0.656), settle into 1(f) positions, 1/3, 2/3, 1/2. In turn, the Fe_2P and $PbCl_2$ structure types are mutually related by a simple translation.

Thus there are a number of crystal structures with nearly identical motifs for the atomic arrangement which are quite extensive among the intermetallic compounds and are characterized by identical coordination polyhedra (nine vertices) differently linked with respect to each other. It can be suggested on this basis that the hexagonal $Mg_2 \cdot SnII$ unit cell proposed in this work, having parameters $a_0 = 13.18 \pm 0.02$ and $c_0 = 6.99 \pm 0.04$ Å, is not the result of arbitrary indexing. If we choose the period a_{hex} in a pseudohexagonal network of Ni atoms in the Ni_2Si structure, as shown in Fig. 1, and set $c_{hex} = 2c_{rhomb}$, then we obtain unit cell parameters close to those given above. However, if we preserve the Ni_2Si unit cell as structural motif we should have z = 18, which does not agree with ρ_e whose value gives z = 15 or 16. This condition can be satisfied if, in addition to the nine Si atoms which are contained in the chosen unit cell of the Ni_2Si structural motif, we put another six Si atoms in place of the six Ni atoms which occupy sites on the edges (2) and on the three-fold axes (4). Thus with a doubling of c_{rhomb} we find 30 Ni atoms per unit cell.

Figure 2 shows one of two possible atomic arrangements which differ by c/2. It should be noted that the proposed structure model is obtained not only by the distortion of Ni_2Si–type structures described above, but also in analyzing the intensities by construction of cross sections perpendicular to

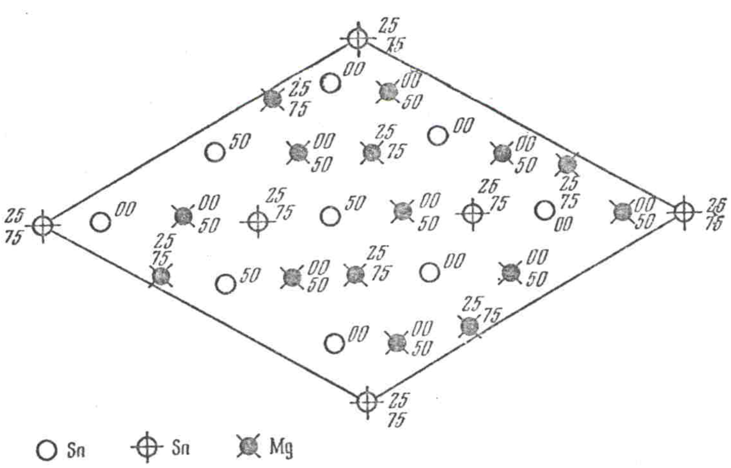

Fig. 2. Projection of the assumed structure model for Mg_2SnII along the c axis. The dark circles and the oblique crosses are Mg atoms at various heights, and the circles and plain crosses are Sn atoms at various heights.