Azide compounds containing water and elements (5) demonstrate some general principles. Elements with higher electronegativity have the greatest influence on the structures. They form finite or infinite metal-azide complexes. The coordination polyhedra are often similar to those in the simple azides. The apparent radii of the azide groups vary between 1.25 Å and 1.65 Å and can be taken as clue to the bonding strength. N-N-N-bond angles in finite surroundings of the nitrogen atoms are irregular. N-N-bonds vary somewhat and can be taken as clue to the bonding strength. M-N-N-bond angles in finite structures are slightly compressed, with the "one-angle" radius for Sn, respectively (mean value 1.950 Å). From these distances, the "one-angle" radius for Sn can be evaluated as 1.98 Å. The Ca atoms appear eight-coordinated, at the center of an irregular bicapped trigonal prism, with Sn-O distances of 2.643(4), 2.626(4), 2.644(6), 2.636(4) and 2.344(6) Å. These bonds are represented as dotted lines in Figure 1.

For octahedra lying in the ab plane (Fig.1) and 148.23(30)° for those linked parallel to the c axis, and corresponding to Sn...Sn distances of 3.963 and 3.953 Å, respectively (mean value 3.958 Å). From these distances, the "one-angle" radius for Sn can be evaluated as 1.98 Å. The Ca atoms appear eight-coordinated, at the center of an irregular bicapped trigonal prism, with Ca-Sn distances of 2.643(4), 2.626(4), 2.644(6), 2.636(4) and 2.344(6) Å. These bonds are represented as dotted lines in Figure 1.

The coordinates numbers for anions are: four for [Sn], with two Sn at 2.061 Å and two Ca at distances of 2.344 and 2.414 Å and five for [2] (two Sn at 2.061 Å and three Ca at 2.364, 2.640 and 2.792 Å), leading to a cubic symmetry arising from the superposition of three orthorhombic (slightly distorted cubic) nets. Thus, the same cell-type of CaSnO₃ (Jeffery, Acta Cryst. (1952) 5, 56) of the monoclinic superstructure of the MI phase, is highly characterized by orientational disorder of the silicate tetrahedra: (a) a fraction, by 70%, of one of the three independent tetrahedra on the threefold axis points the +z direction (a B orientation), while the remaining fraction points the +z direction (a U orientation), and (b) all tetrahedra are tilted in such a way that their apical bonds, on the threefold axis, slightly swing away from the threefold axis with 60° being kept in the axis.

The superstructure of MI has also been fully determined based on 3896 diffraction intensities (a=31.083(8) Å, b=7.027(2) Å, c=18.499 Å, B=94.12(2)°, Cm, Z=96 × C2₄g, 945g, 905g, R=0.037). The structure of the silicate tetrahedra in a plane corresponding to the mirror plane passing through the origin and parallel to (100) of Rh; the broken lines trace the cell of <MI>. In terms of the orientational characteristics with respect to the subcell axes, the silicate tetrahedra may be classified into three categories: (1) those having fixed orientations, (2) those showing disorder in the two orientations U and D(U-D disorder), and (3) those showing U-D-G disorder, where G (Fig.1) represents