obtained by difference. Hydrazine hydrochloride will usually be found a convenient reductant ($N_2H_4+O_2 \rightarrow N_2+2H_2O$). The procedure was found very satisfactory for the determination of the IO_3 radical in schwartzembergite.

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Domain structure in garronite: a hypothesis

GARRONITE, described as a new zeolite by Walker (1962), is similar to gismondine but was considered an independent species because of its higher symmetry and its higher Si-content. According to Fischer (1963), gismondine is monoclinic pseudo-tetragonal $P2_1/c$ with *a* 10·02, *b* 10·62, *c* 9·84 Å, and $\beta = 92° 25'$, *b* being the pseudo-quaternary axis; its framework is topologically tetragonal $I4_1/amd$. Gismondine has an ordered distribution of Si and Al in the tetrahedra. Since the ratio Si:Al is close to 1, the structure presents an alternation of SiO_4 and AlO_4 tetrahedra in accordance with the Loewenstein rule. This ordered distribution lowers the symmetry of the framework from the tetragonal to the monoclinic system.

The unit cell of garronite was shown by Barrer, Bultitude, and Kerr (1959) to be tetragonal by means of X-ray powder data (*a* 10·01, *c* 9·87 Å); Taylor and Roy (1964) found *a* 9·85 and *c* 10·32 Å. After Walker (1962), garronite is optically uniaxial at one end of the elongated crystals, but biaxial and twinned at the other.

Now one of us (A. A.) has obtained X-ray single crystal photographs of garronite, which contain only diffuse spots and hence are unsuitable for structure determination, but nevertheless confirm on the whole the tetragonal symmetry. We feel these data are now sufficient to put forward the following hypothesis: garronite crystals grow as single crystals with a disordered gismondine framework, but subsequently undergo a partial disorder–order transformation with formation of submicroscopic domains of four kinds. The possibility of four kinds of domains arises from the fact that in the disordered tetragonal form we have $a = b$ and $\gamma = 90°$, whereas in the ordered monoclinic form $a \neq b$ and $\gamma \neq 90°$: in each zone of the disordered crystal, when ordering starts, we may have $a > b$ or $a < b$, and also $\gamma > 90°$ or $\gamma < 90°$.

It is worth noting that, in other cases of ordering in framework silicates (for instance in basic plagioclases), antiphase domains develop, but this would not be so in the case of garronite, the domains of which would not be superimposed by translation alone, as required in antiphase domains. In basic plagioclases the domain structure develops in those crystals with anorthite structure but with a ratio Si:Al > 1: garronite itself has a ratio Si:Al = 1·5, which may favour these partial domain orderings in a structure proper for Si:Al = 1.

If our hypothesis is right, this would not be the first example of an order-disorder polymorphism in zeolites: the tetragonal natrolite (Andersen, Danø, and Petersen, 1969) is beyond any doubt the disordered form of the common orthorhombic natrolite, as has already been clearly stated by Pabst (1971), who found a particular association of natrolite crystals akin to twinning, which can be considered as an ordering in macro-domains of a previous disordered tetragonal natrolite.

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Confirmation of Sabatier's Nevada twin in Mont-Dore sanidine

IN a previous issue of this Magazine, G. Sabatier (1973) has described the second occurrence of the Nevada twin in a sanidine crystal of composition $Ab_{53}Or_{47}$ (mole %), which he had collected in the altered trachyte (sancyite) on the SW. slope of the Mont-Dore old volcano in the Massif Central (France).

Only one specimen showed twinning. Owing to its large size (over 2 cm across) and its earthy lustre, it was unsuited for reflection goniometry. Sabatier was nevertheless able to decipher the twin law by means of a contact goniometer. He identified the twinning operation as a 180° rotation about $[\bar{1}12]$; Mont-Dore thus became the second occurrence of the rare twin law established by Drugman (1938).