Iriginite anion topology. The structure of iriginite (Serezhkin et al. 1973) contains sheets that are based upon the iriginite anion topology illustrated in Figure 25f. This anion topology contains alternating up (**U**) and down (**D**) arrowhead chains, oriented vertically in Figure 25f, that are separated by a combination of three **R** chains, giving the repeat sequence **URRRDRRRU**… (Fig. 27b). The sheet in the structure of iriginite is derived by populating each pentagon in the anion topology with a uranyl ion, resulting in $Ur\phi_5$ pentagonal bipyramids, and two-thirds of the squares correspond to $Mo^{6+}\phi_6$ octahedra, which share edges to form dimers. One third of the squares and all of the triangles of the anion topology are empty. The interlayer contains one symmetrically distinct H_2O group, and adjacent sheets are connected through H bonds (Fig. 28d). No other mineral is known that contains a sheet that is based upon the iriginite anion topology, but the sheets in the synthetic compound $[Ca(UO_2)MoO_4O_{14}]$ (Lee and Jaulmeds 1987) are based upon the iriginite anion topology, with half of the pentagons in the anion topology containing uranyl ions and half containing Ca (Burns et al. 1996).

Sayrite anion topology. The sayrite anion topology is shown in Figure 25g. This complex anion topology contains both up (**U**) and down (**D**) arrowhead chains, as well as **P** and **R** chains. The chains are all oriented vertically in Figure 25g, and are arranged such that each **P** chain is flanked by two arrowhead chains with the same sense of direction, giving **UPU** or **DPD** sequences. These two sequences alternate in the anion topology, and are separated by **R** chains, giving the sequence **RUPURDPDRUPU**… (Fig. 27c). The sayrite-type sheet results when every pentagon and square of the anion topology are populated by uranyl ions, giving $Ur\phi_5$ pentagonal bipyramids and $Ur\phi_4$ square bipyramids (Fig. 25h). These sheets occur in the structure of sayrite (Piret et al. 1983) (Fig. 28e), as well as the synthetic phase $K_2[(UO_2)_5O_8](UO_2)$ (Kovba 1972, Burns et al. 1996).

The interlayer in the structure of sayrite contains one symmetrically distinct Pb^{2+} cation. It is coordinated by five O_{Ur} atoms of adjacent sheets of uranyl polyhedra, as well as one equatorial anion of the uranyl polyhedra of an adjacent sheet and two H_2O groups that are located in the interlayer. The $Pb^{2+}\phi_8$ polyhedra are isolated from each other in the interlayer, contrary to the trend observed in most other Pb^{2+} uranyl oxide hydrate minerals in which the $Pb\phi_n$ polyhedra occur as dimers in the interlayers.

Curite anion topology. The structure of curite contains sheets that are based upon the curite anion topology shown in Figure 25j. This unusually complex anion topology cannot be described as a simple chain-stacking sequence using only the chains previously introduced. A new chain is required that contains pentagons, triangles and squares, arranged such that each pentagon shares an edge with a triangle, and the opposite corner of the triangle is shared with a distorted square. These groups of polygons are arranged to form a chain with gaps between the squares and pentagons, as shown in Figure 29a. The chain has a directional sense owing to the presence of an arrowhead (a pentagon and a triangle sharing an edge), and is designated $\mathbf{U^m}$ and $\mathbf{D^m}$, for up and down (modified) pointing chains, respectively. The curite anion topology can be characterized by the chain-stacking sequence $\mathbf{U^mDU^mD}$… as illustrated in Figure 29b.

The curite sheet (Fig. 25i) is obtained by populating all pentagons and squares of the anion topology with uranyl ions, giving a sheet that is composed of edge- and corner-sharing $Ur\phi_4$ square bipyramids and $Ur\phi_5$ pentagonal bipyramids (Taylor et al. 1981). Curite is the only mineral that contains this sheet of uranyl polyhedra, although an identical sheet was recently found in a synthetic Sr analogue of curite, $Sr_{2.84}[(UO_2)_4O_4(OH)_3]_2(H_2O)_2$ (Burns and Hill 1999). The structure of curite contains two symmetrically distinct Pb^{2+} cations in the interlayer. Both are coordinated by nine