

Tetrahedrite–octahedrally quasicrystalline twin

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<http://web.me.com/whitby/Octahedron/Welcome.html>

References

TwinQuasi.pdf

Octahedron1stEd.pdf

Repeated twins–See bookmarks MINERAL: Chrysoberyl, Cerrusite

Penetration twins–See bookmarks MINERAL: Tetrahedrite, Staurolite

E. S. Dana & W. E. Ford *A Textbook of Mineralogy* 4th ed., John Wiley, 1932
Tetrahedrite twin–See Figure 434 on page 187

Introduction

Tetrahedrite has two twins which appear to be interpenetrant regular tetrahedra—one octahedrally crystalline and one octahedrally quasicrystalline. Both are shown in Dana's *Textbook of Mineralogy*. In each twin, the tetrahedra have a common axis of threefold symmetry. In the octahedrally crystalline twin, one tetrahedron is inverted relative to the other. In the octahedrally quasicrystalline twin, one tetrahedron is simply rotated 60-degrees to the other. The octahedrally crystalline twin is shown in Octahedron1stEd.pdf; the octahedrally quasicrystalline twin is shown here.

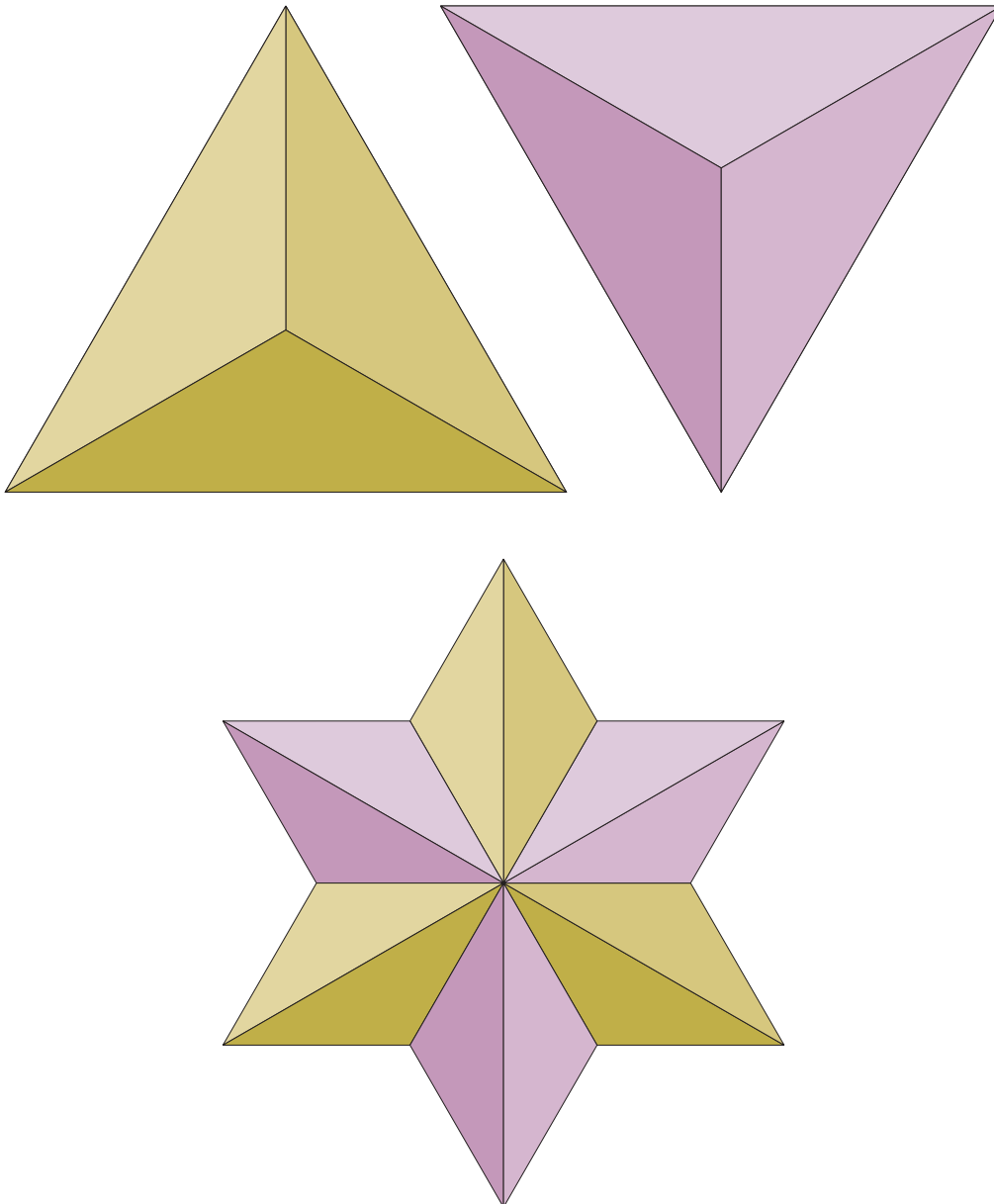


Fig 1—Two regular tetrahedra with a common vertex

Two identical regular octahedra are shown at the top of the figure. They differ by a rotation of 60-degrees about an axis of threefold symmetry. The two tetrahedra have been merged into a single form which occurs in tetrahedrite.

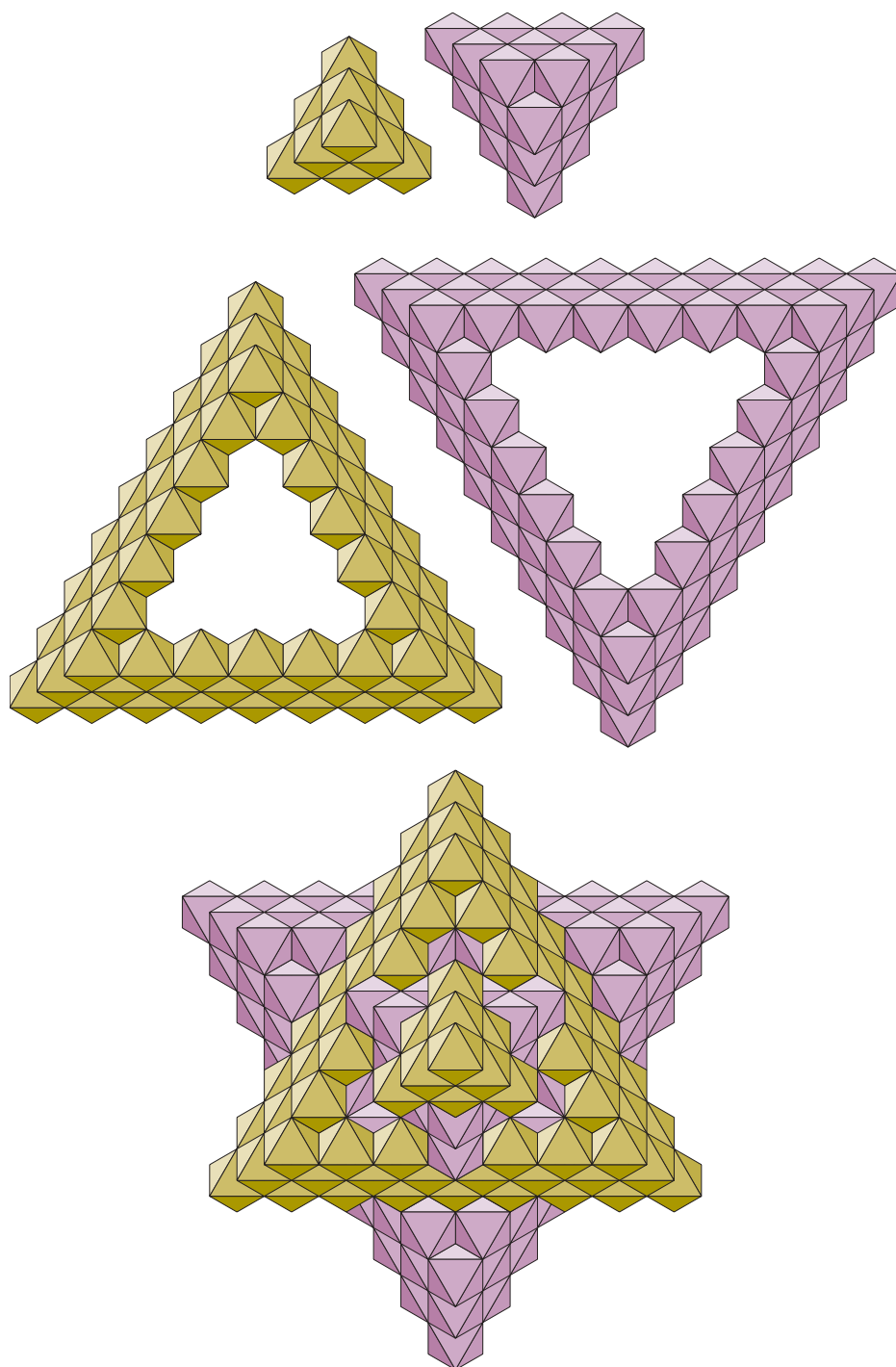


Fig 2–Tetrahedrite twin–octahedrally quasicrystalline

The figure shows how identical regular octahedra can produce the form of an interpenetrant twin of tetrahedrite consisting of two regular tetrahedra with a common vertex. The components of the assembly each contain three facial layers of octahedra. The octahedra colored yellow are identically oriented; the violet octahedra are rotated 60-degrees to the yellow.

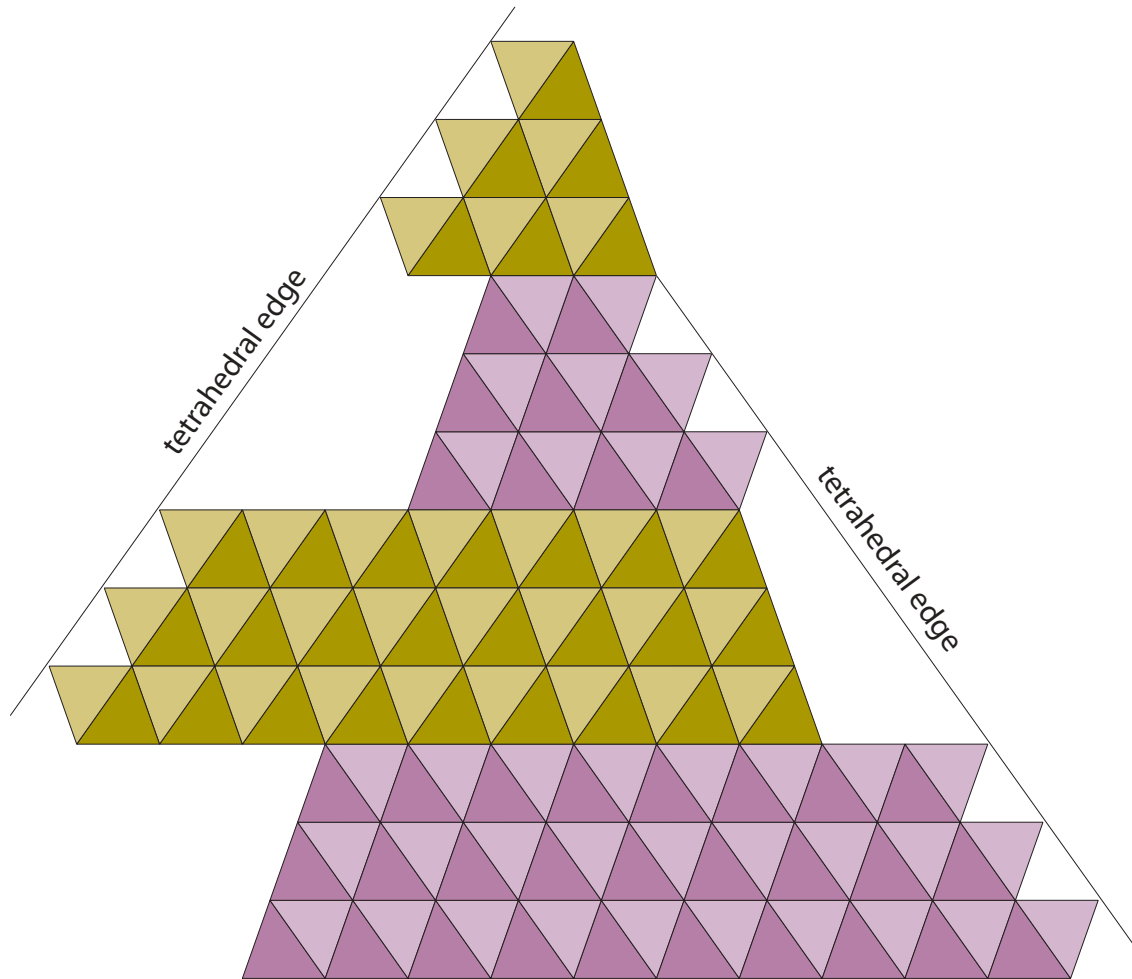


Fig 3—Tetrahedrite twin viewed parallel to a tetrahedral face

The assembly of the previous figure was viewed parallel to common threefold axis of the twin. Here, the view is normal to that axis and parallel to a face of each of the two tetrahedra. The components of the assembly must consist of three facial layers or a multiple of three facial layers to continue the facial planes of the two tetrahedra. The intercomponent join is between the faces of the octahedra.

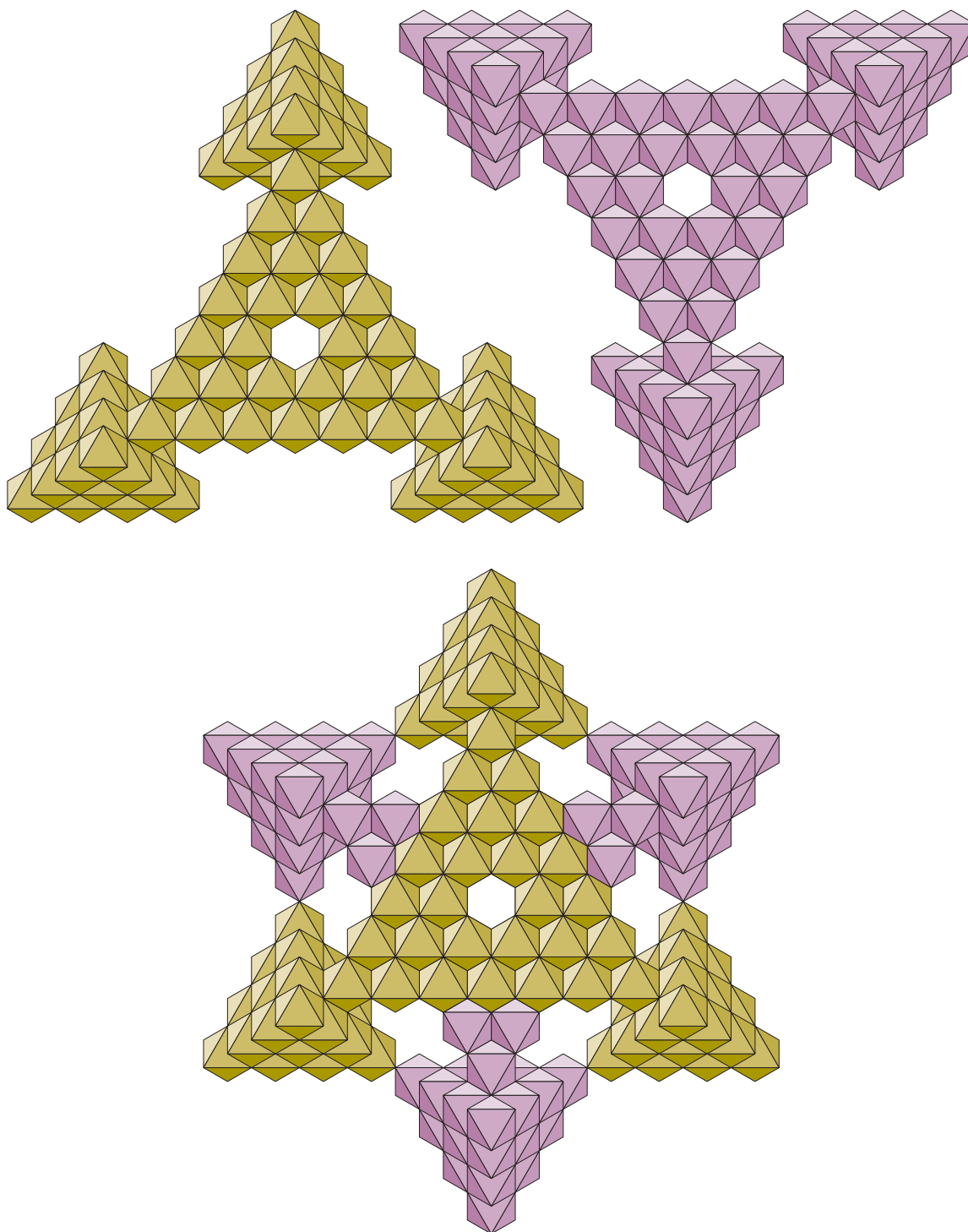


Fig 4—Identical tetrahedral assemblies joined facially

Two identical assemblies are shown at the top of the figure. They differ by a 60-degree rotation. At the bottom, the two assemblies are facially joined. The radially outward faces of the six tetrahedra are the same as the faces of the tetrahedrite twin.

