

## Porphyrin-joining alanine sidechain to C-atom of rim

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

### Reference

1.Octahedron1stEd.pdf-bookmark HEME-pages 385-388. Shows the ways in which external N-atoms triplet join to the N-atoms of porphyrin. Shows how glycine can to the peripheral C-atoms of porphyrin and how the NH<sub>2</sub>O-group of glycine can join to a C-atom of the porphyrin rim.

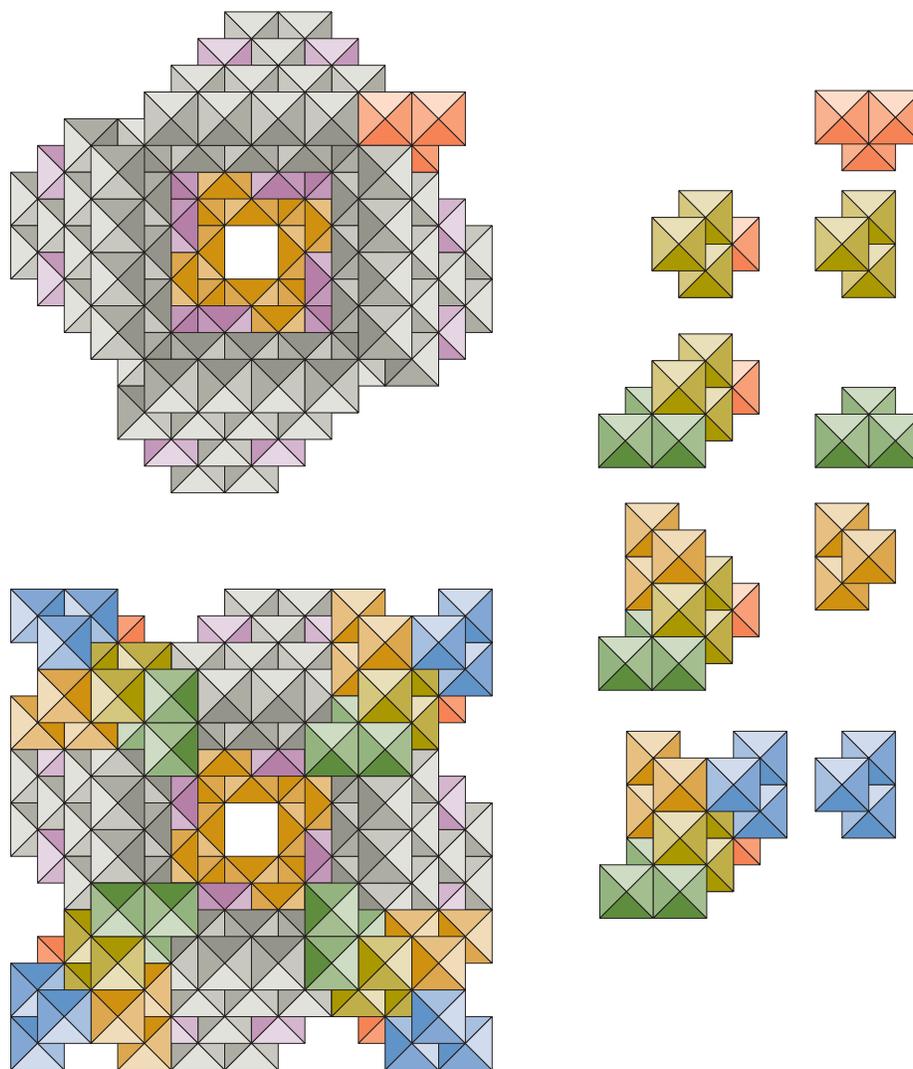
[Heme.pdf is an excerpt of this material from *Octahedron*]

2. Pthalo.doc-Porphyrin, phthalocyanine, and their relatives. Shows how the atoms assemble as the subunits which join to form porphyrin, phthalocyanine, and their relatives.

### Introduction

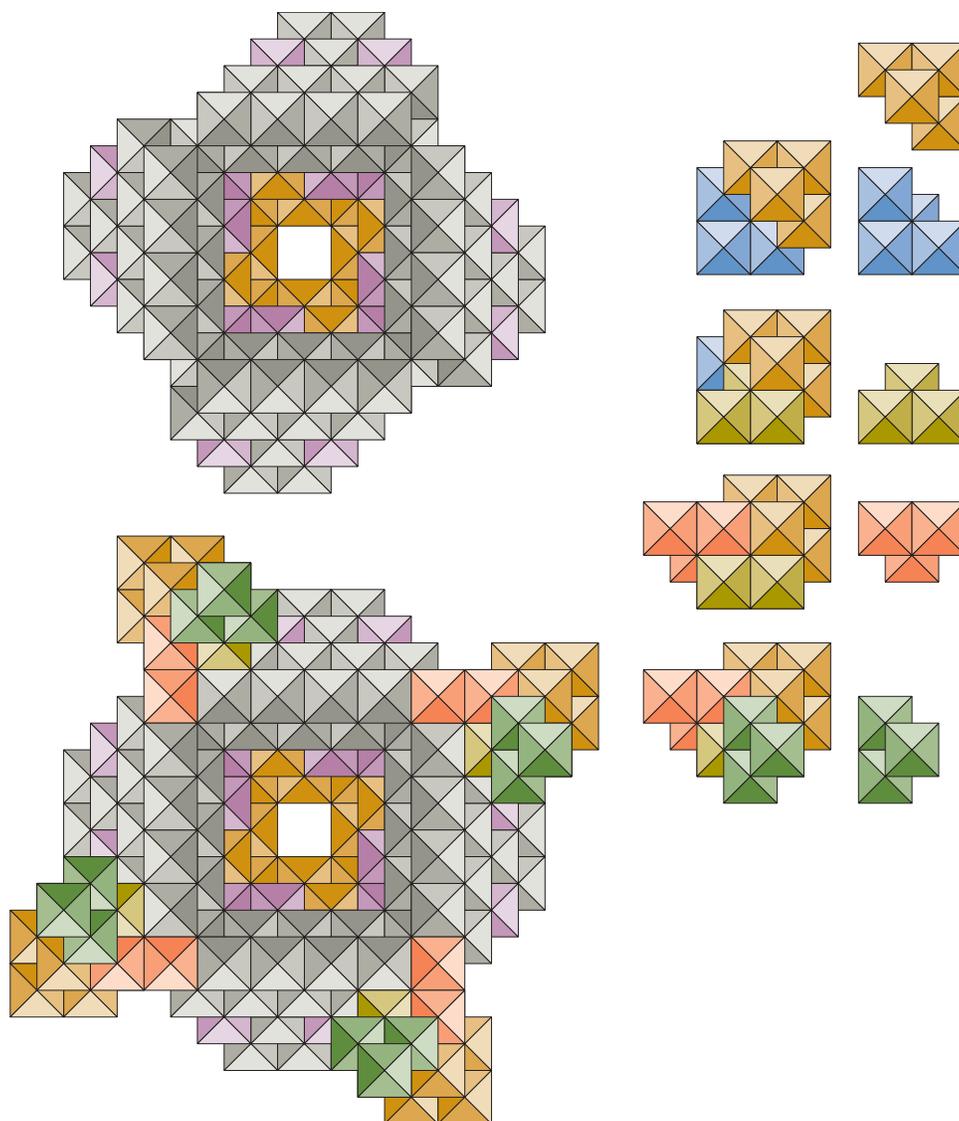
Each of the four subunits which assemble as L-porphyrin can form a cleft-join with the C-atom sidechain of alanine. The orientation of the sidechain C-atom is shown in Fig.1. This sidechain orientation permits two orientations of alanine to join with the L-porphyrin. One is shown in Fig.1, the other in Fig.2. Only one orientation of alanine can join with a C-atom at the rim of D-porphyrin. It is shown in Fig.3.

2 Porphyrin-joining alanine sidechain to C-atom of rim



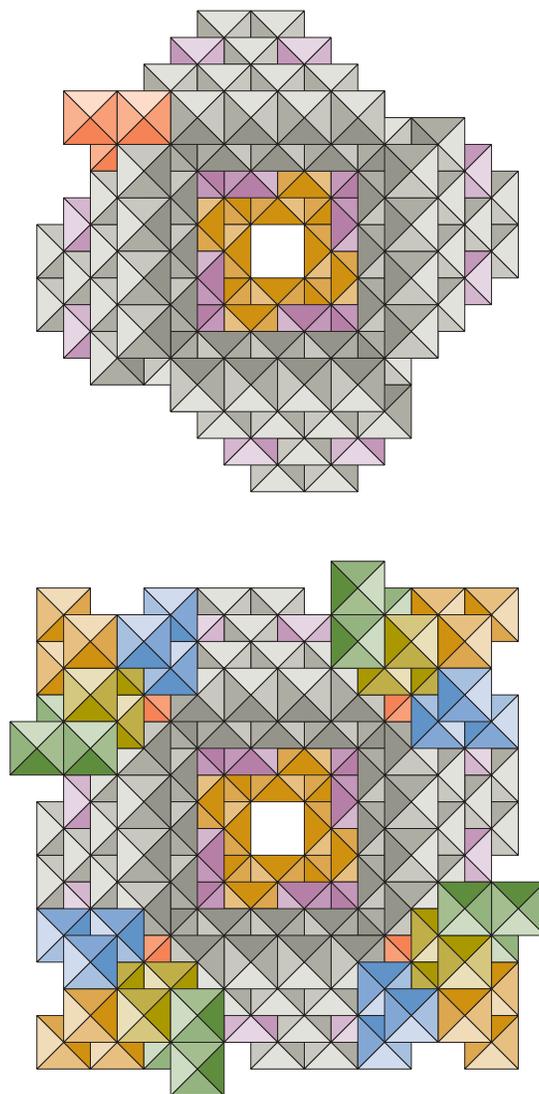
**Fig. 1 L-Porphyrin with four alanines (orientation #1) joined to C-atoms at rim**

An L-porphyrin is shown at the top of the figure. A C-atom whose He-octas are colored red is cleftly joined to one of the C-atoms at its rim. The alanine whose assembly is shown on the right has its sidechain C-atom in the same orientation as the C-atom attached to the porphyrin and in the same color. At the bottom left, the alanine side chain has taken the place of the red C-atom. Three additional alanines which differ by a rotation of 90- or 180-degrees have made identical joins with the other three available C-atoms of the rim.



**Fig. 2 L-Porphyrin with four alanines (orientation #2) joined to C-atoms at rim**

The porphyrin and the cleft join between the red-colored C-atoms of the sidechains and the C-atoms of its rim are identical to the previous figure, but the alanines here have a different orientation. The alanines of the previous figure obstruct the atom-holding cavity of the porphyrin. Here, they do not.



**Fig. 3 D-Porphyrin with four alanines (orientation #1) joined to C-atoms at rim**

The rim C-atoms of the D-porphyrin shown here can join cleftly only with alanines in the orientation shown here. Although the alanines have the same orientation as those of Fig. 1, the change in the hand of the porphyrin results in an unobstructed cavity.

