

Lactone-joined L-triplets

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

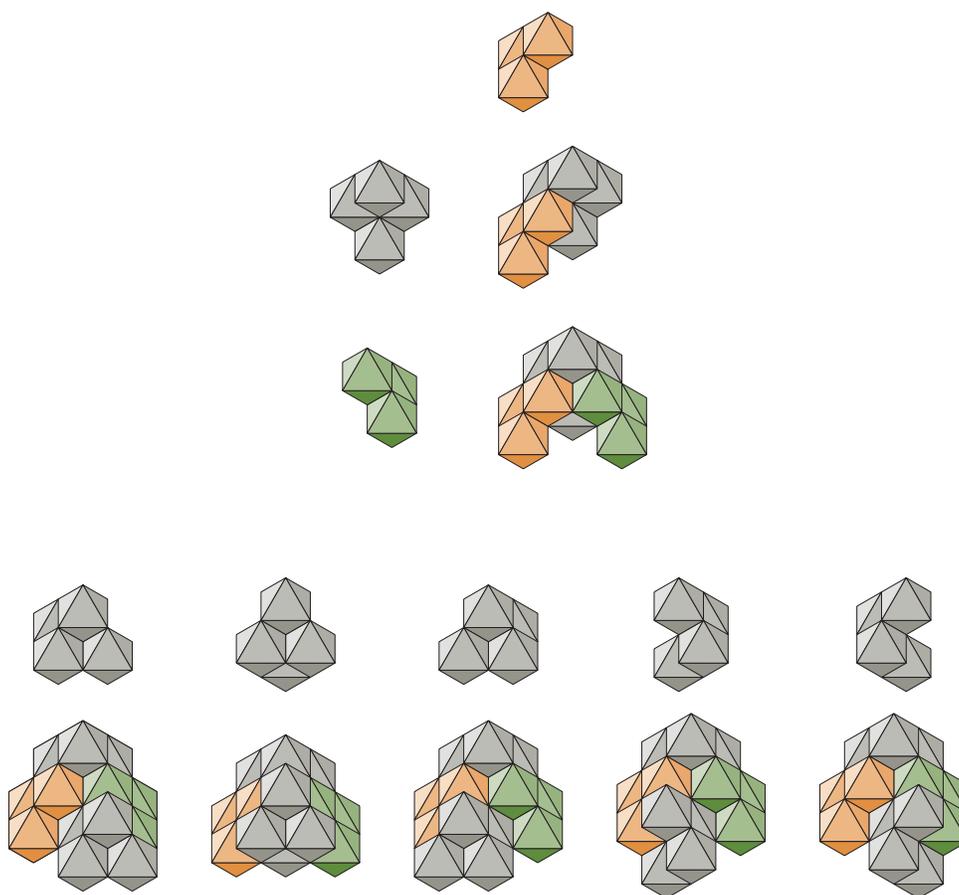
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References

1. Robert Whitby, [Octahedron1stEd.pdf](#)
2. Lubert Stryer, *Biochemistry* 2d ed., W. H. Freeman, San Francisco, 1981, Part 1, Chapter 9, "Connective tissue proteins" Figure 9-12 Formulas of ascorbic acid and ascorbate, page 192.

Introduction

This paper looks at the possible ways in which the join between an end C-atom of one L-triplet can be joined to an O-atom in such a way that the O-atom can join with the end C-atom of another L-triplet so that the resulting join might be construed as a lactone ring.



Lactone-join possibles

The figure shows how each of two C-atoms can be cleftly-joined to a single O-atom and how a second O-atom can be cleftly joined to either of the C-atoms without preventing either of the two C-atoms from cleftly joining with an additional C-atom.

The orange C-atom in the top row is cleftly joined to the O-atom in the second row.

The green C-atom in the third row is cleftly joined to the O-atom making a symmetrical C-O-C assembly.

The fourth row shows five O-atoms each in its own orientation. Each of these O-atoms can make a cleft-join to one or both of the near clefts of the C-atoms of the C-O-C assembly.

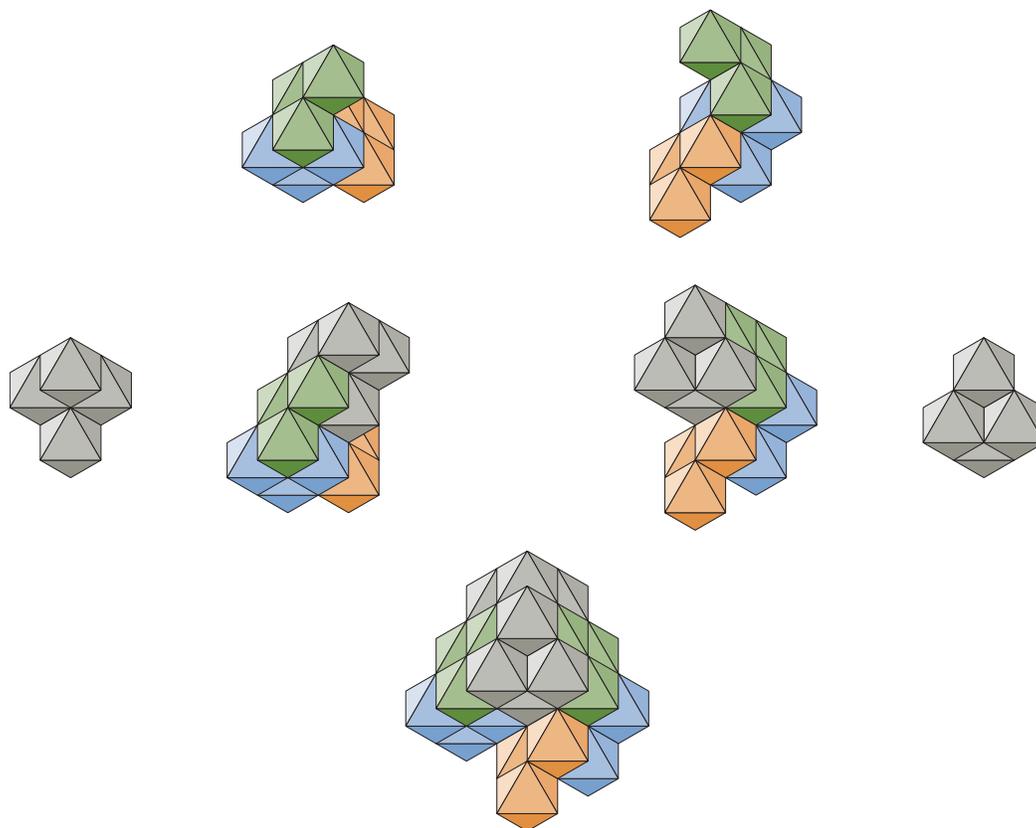
The fifth row shows the second O-atom cleftly joined to a C-atom of the C-O-C assembly. The leftmost join is to the green C-atom. The near cleft of the orange C-atom is blocked by the added O-atom.

In the second from the left assembly, the added O-atom is cleftly joined to both the orange C-atom and green C-atom. This makes a symmetrical assembly.

The added O-atom in the middle assembly is cleftly-joined to the orange C-atom and blocks the near cleft of the green C-atom.

The added O-atom of the assembly to the right of middle is cleftly joined to the orange C-atom and blocks the near cleft of the green O-atom.

The added O-atom of the rightmost assembly is cleftly-joined to the green C-atom and blocks the near cleft of the orange C-atom.



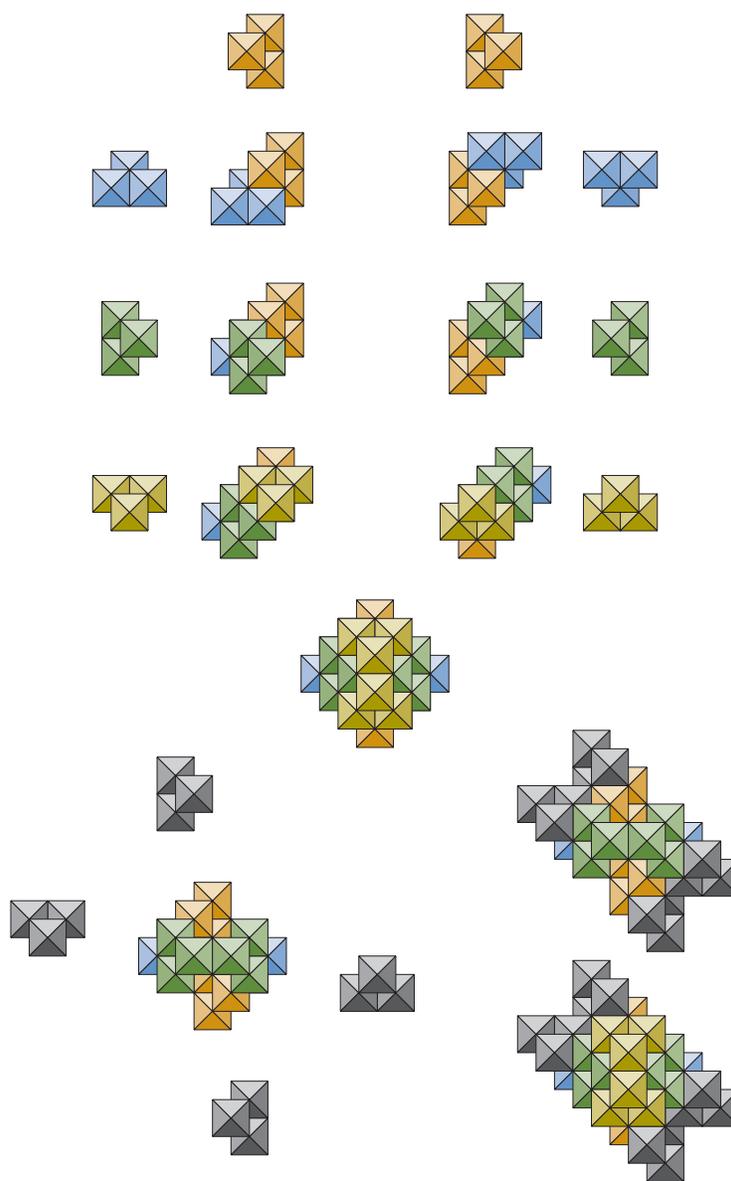
Lactone ring type joining of two L-triplets by two O-atoms

The figure shows how an end C-atom of each of two L-triplets can be joined by an O-atom in a lactone type join.

The two L-triplets are shown in the top row of the figure.

An O-atom is cleftly joined to the green colored C-atom at one end of each of the L-triplets in the second row.

The two L-triplets are joined at the bottom so that each green C-atom is cleftly joined to the O-atom of the other triplet.



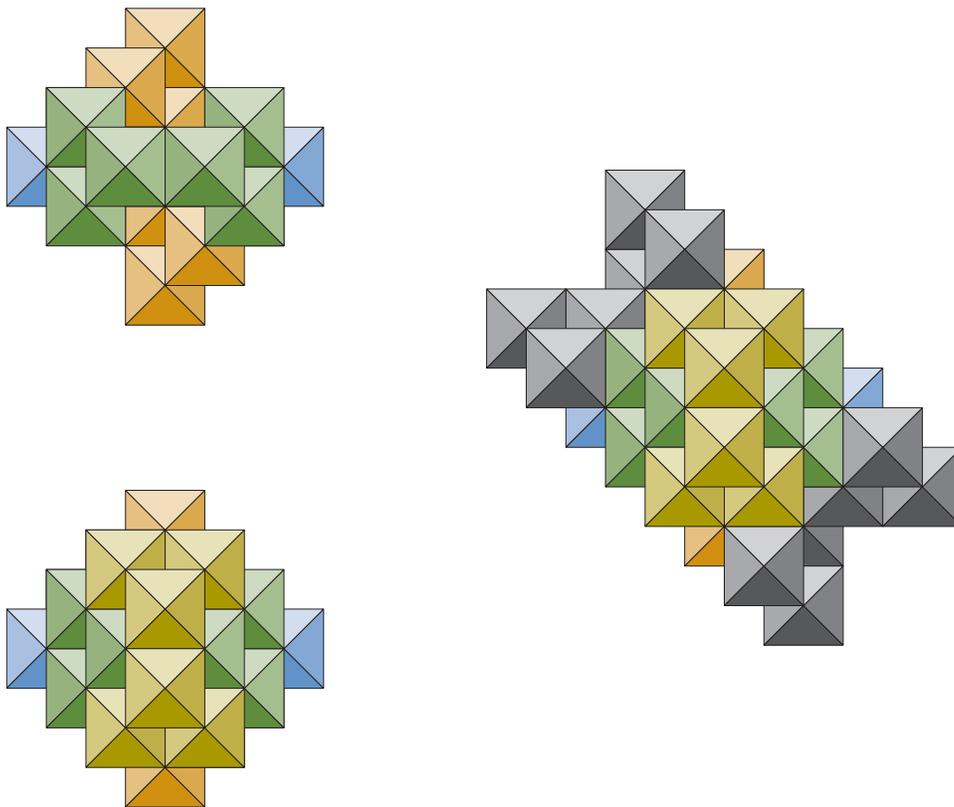
Lactone joined L-triplets

The figure shows the atomic arrangement of two L-triplets which are joined by two O-atoms to form a rotationally symmetrical assembly. It shows how an O-atom can join to each of the two remaining C-atoms of each triplet.

The upper part of the figure shows the assembly of two identical triplets whose orientations differ by one-half turn about an axis perpendicular to the projection plane. The nearest C-atoms that are colored green are each joined by an O-atom colored yellow.

The two L-triplets with O-atoms join to form the assembly of the fourth row.

At the bottom, O-atoms are joined to each of the two lower C-atoms of each L-triplet which are colored either blue or orange. The resulting assembly is shown both with and without the yellow colored O-atoms which are each cleftly joined to the green C-atoms of the two L-triplets. The completed assembly has a twofold rotational symmetry of one-half turn about the vertical diameter that is perpendicular to the projection plane.



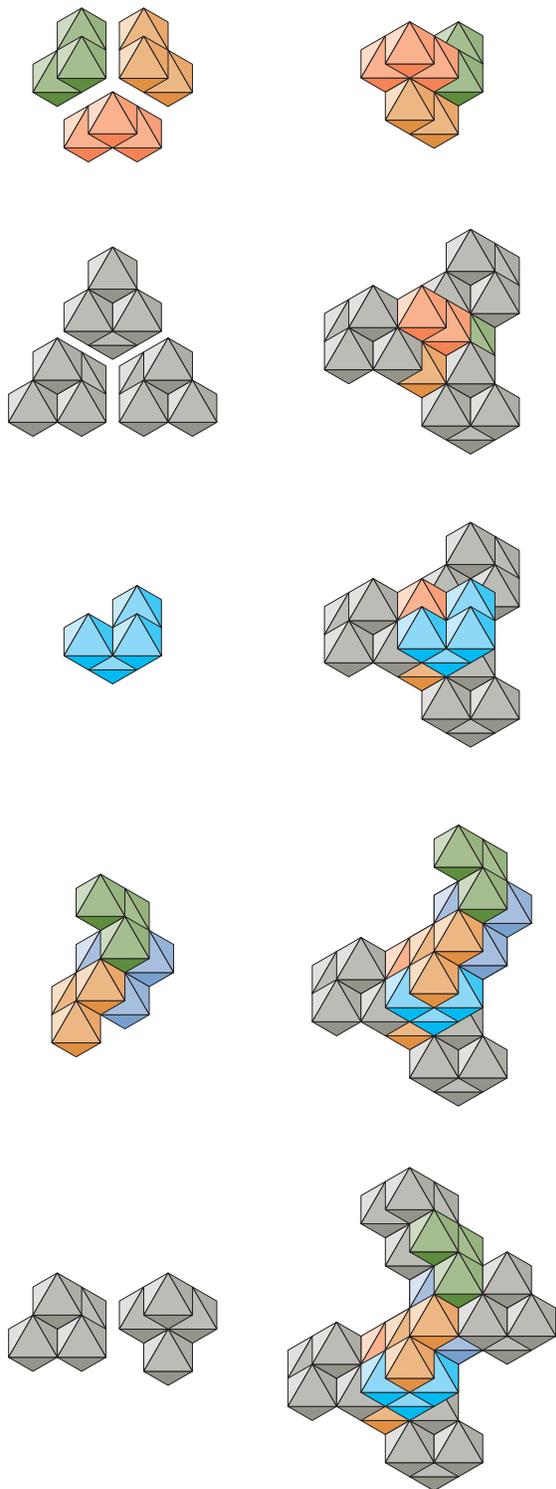
An ascorbate possible

The figure shows three views of an assembly of two L-triplets which are joined together by two O-atoms.

At top left, the two triplets are shown without any O-atoms.

At bottom left, the triplets are shown with the adjoining O-atoms which are colored yellow. Each of the yellow O-atoms is cleftly joined to each of the green colored C-atoms.

On the right, an additional O-atom has been cleftly joined to each of the remaining C-atoms which are colored blue or orange.



Ascorbic acid as lactone joined L-triplets

The figure shows how the atoms are arranged in a lactone joined pair of L-triplets in which each of five C-atoms is cleftly joined to one O-atom and the sixth C-atom is cleftly joined to two O-atoms.

At the top of the figure, the three C-atoms that form one L-triplet are shown on the left and the L-triplet is shown on the right. The triplet is oriented so that the facial threefold helical axis is perpendicular to the projection plane.

In the second row, the three O-atoms on the left are cleftly joined to the C-atoms of the L-triplet.

In the middle row, the O-atom on the left is cleftly joined to the red C-atom of the L-triplet. This C-atom is now cleftly joined to two O-atoms.

The row just below the middle shows the second L-triplet separately on the left. On the right, the orange C-atom of the second L-triplet is cleftly joined to the blue O-atom forming the two triplet assembly.

At bottom, each of two O-atoms on the left are shown cleftly joined to either the blue C-atom of the second L-triplet or to the green C-atom of the second L-triplet. This completes the assembly.