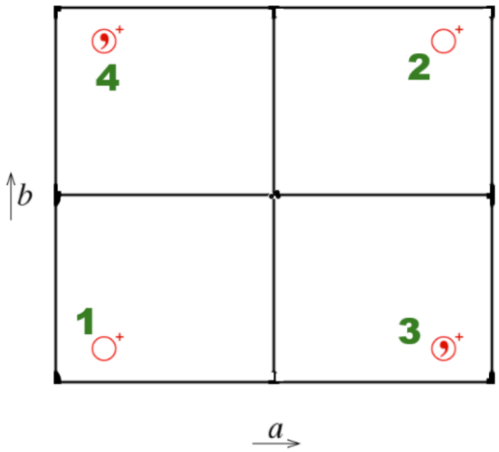
Question 1

The figure below shows the orthorhombic Space Group no. 25, Pmm2

i) What kind of symmetry element would create molecule 2 from molecule 1? Give the Hermann-Mauguin symbol for this symmetry and show how it would be represented on the space group diagram.

ii) Repeat i) above for molecules 3 and 4

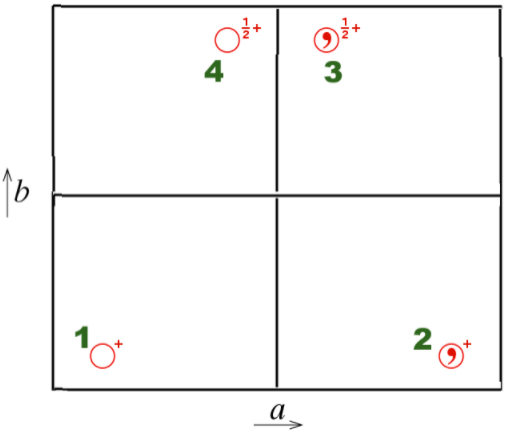


Question 2

The figure below shows the orthorhombic Space Group no. 31, $Pmn2_1$

i) What kind of symmetry element would create molecule 2 from molecule 1? Give the Hermann-Mauguin symbol for this symmetry and show how it would be represented on the space group diagram.

ii) Repeat i) above for molecules 3 and 4

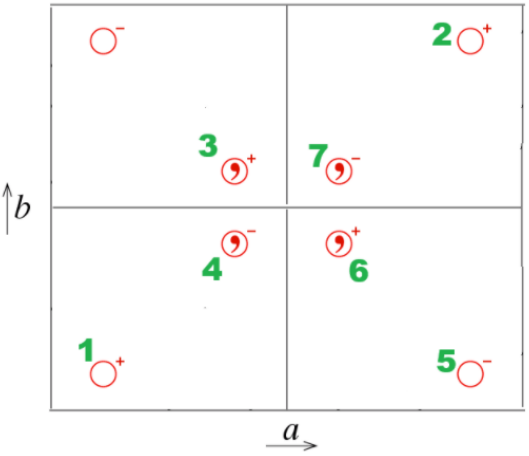


Question 3

The figure below shows the orthorhombic Space Group no. 50, Pban

i) What kind of symmetry element would create molecule 2 from molecule 1? Give the Hermann-Mauguin symbol for this symmetry and show how it would be represented on the space group diagram.

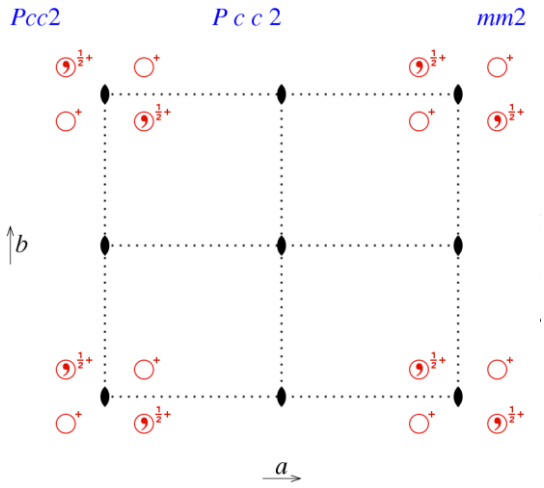
ii) Repeat i) above for molecules 3 to 7



Question 4

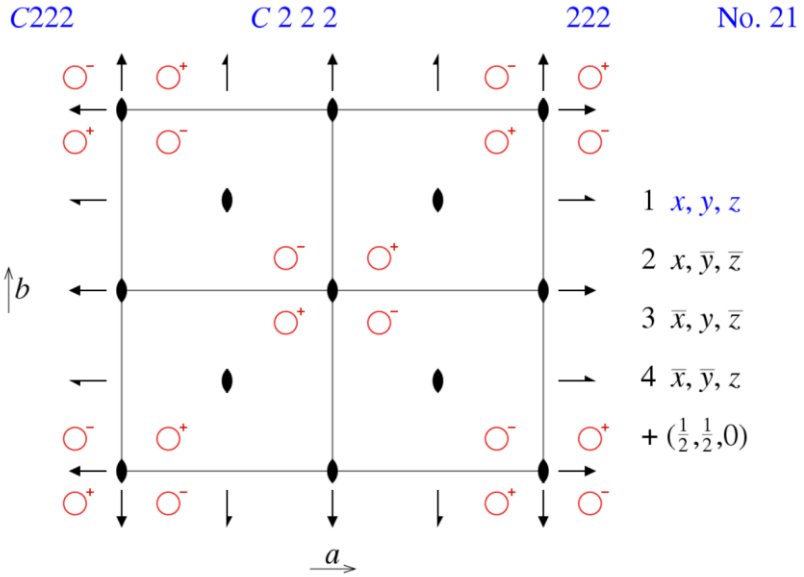
The figure below shows the orthorhombic Space Group no. 27, Pcc2

i) What is the point group for this space group?
ii) What do the c's mean in the space group name?
iii) What is the Wyckoff multiplicity of a molecule with generic coordinates (x,y,z) in the unit cell?
iv) What is the Wyckoff multiplicity of a molecule with coordinates (½, ½ , z) in the unit cell?
v) Is this space group enantiomorphic?



Question 5

The diagram below shows the orthorhombic space group, C222



(i) What does orthorhombic mean in terms of the length of the three sides, a, b, c, and the angles between them, α, ß, and γ?
(ii) Is this space group Primitive, Face Centred, Body Centred, or Base Centred
(iii) What does **222** mean in the space group title?
(iv) Is there a centre of symmetry in the cell? Justify your answer.
(v) What is the multiplicity of the general position, (x, y, z), for the space group?
(vi) What kind of symmetry is denoted by the  symbol in the diagram above?
(vii) What kind of symmetry is denoted by the  symbol in the diagram above?