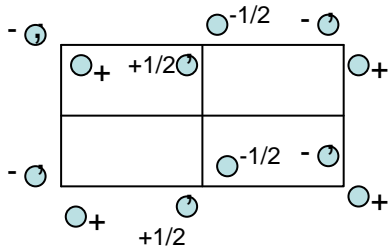


Tutorial V : Space Groups

1. Explain (a) 4_1 screw axis and (b) diamond glide with suitable diagrams.
2. Discuss the symmetry elements and the directions in which they lie in the hypothetical space group given below (assume the conventions of the International Tables of Crystallography).



3. Given the space groups i) $P2_1/a$ ii) $P2_1/c$ and 2) $Pbam$ find the Bravais Lattice, crystal system and point group.
4. Generate other symmetry equivalent positions of the fractional coordinate x,y,z in the space group $Immm$. Explain whether this space group is centric or acentric.
5. Show how you obtain the systematic absences given by
 - a) n -glide perpendicular to b
 - b) I - centered lattice
6. Show how you obtain the systematic absences given by a C -centered lattice
7. Write down the coordinates of the point obtained after (a) b - glide (b) 2_1 screw operation of the $(0.25,0.25,0.25)$ position.