SOLID STATE CHEMISTRY

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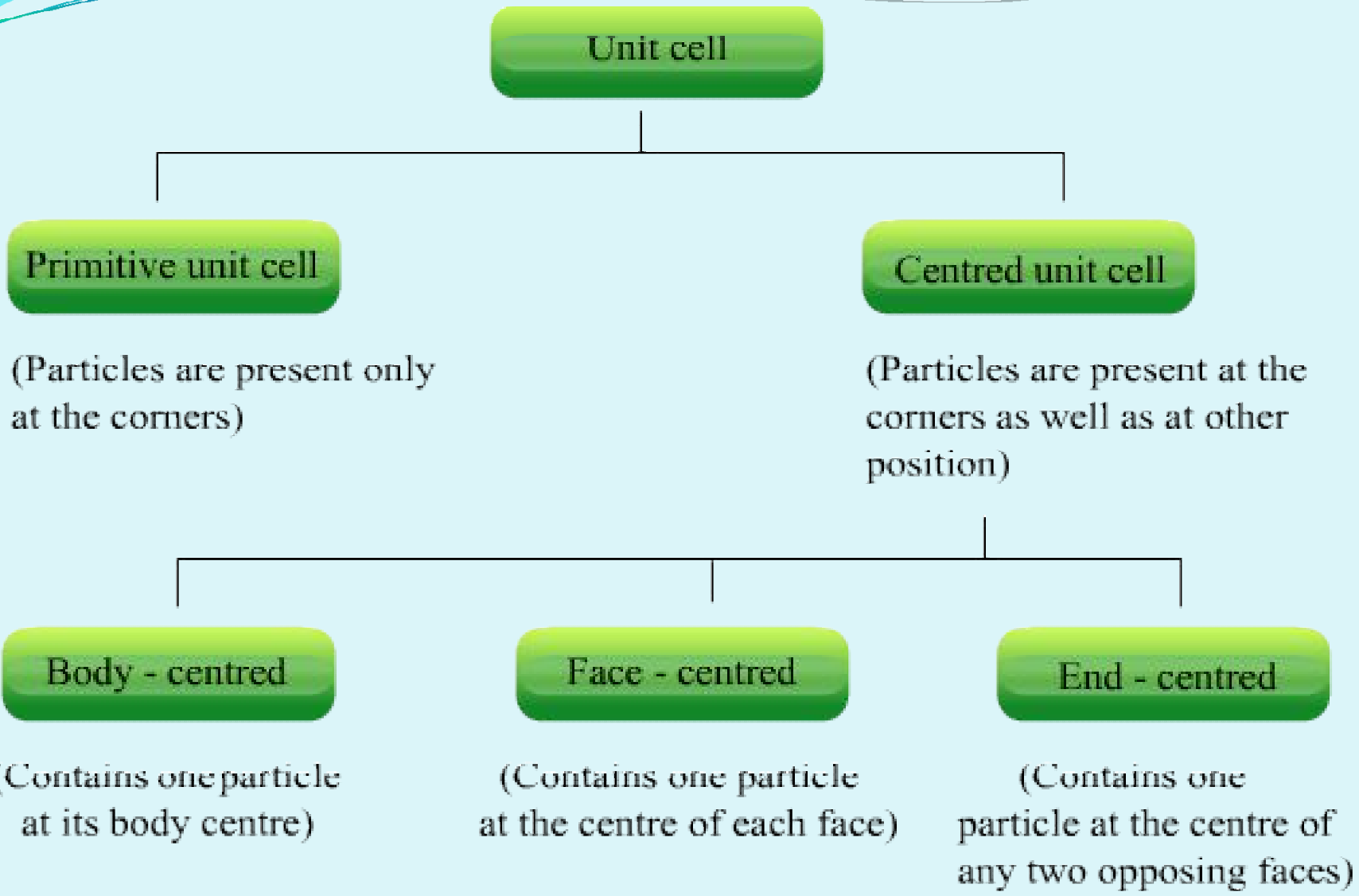
Space Lattice

- It is an arrangement in space of an isolated points in regular pattern that show the position of atoms or ions in a crystal.

- A regular three dimensional arrangement of equivalent points in space that shows the geometry of the crystal.

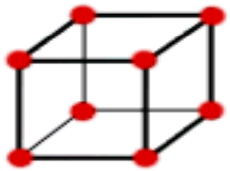
Unit Cell

- It is the smallest portion of a space lattice which on moving equal distances in various directions reproduces the whole crystal structure.

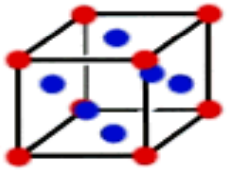

Unit cell
Primitive unit cell
(Particles are present only at the corners)
Centred unit cell
(Particles are present at the corners as well as at other position)
Body - centred
(Contains one particle at its body centre)
Face - centred
(Contains one particle at the centre of each face)
End - centred
(Contains one particle at the centre of any two opposing faces)

Seven Crystal System

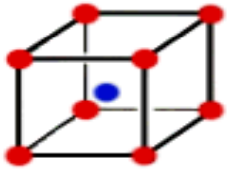
Sr. No.	Crystal System	Axial length of Unit Cell	Inter axial angles	Number of Lattice in the system
1	Cubic	$a = b = c$	$\alpha = \beta = \gamma = 90^0$	3
2	Tetragonal	$a = b \neq c$	$\alpha = \beta = \gamma = 90^0$	2
3	Orthorhombic	$a \neq b \neq c$	$\alpha = \beta = \gamma = 90^0$	4
4	Monoclinic	$a \neq b \neq c$	$\alpha = \beta = 90^0 \neq \gamma$	2
5	Triclinic	$a \neq b \neq c$	$\alpha \neq \beta \neq \gamma \neq 90^0$	1
6	Trigonal	$a = b = c$	$\alpha = \beta = \gamma < 120^0, \neq 90^0$	1
7	Hexagonal	$a = b \neq c$	$\alpha = \beta = 90^0$, and $\gamma = 120^0$	1



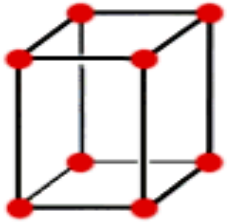
Simple cubic



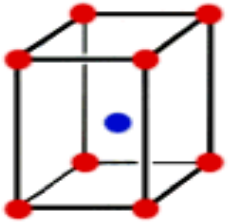
Face-centered cubic



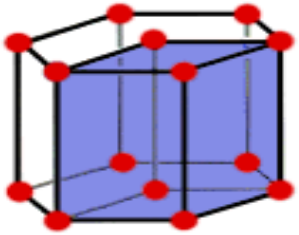
Body-centered cubic



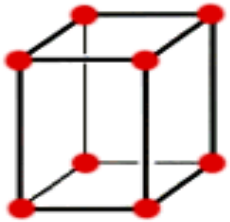
Simple tetragonal



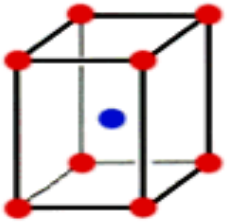
Body-centered tetragonal



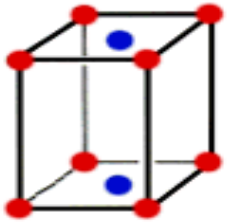
Hexagonal



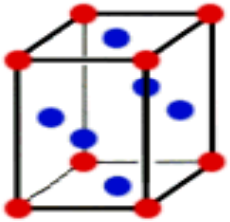
Simple orthorhombic



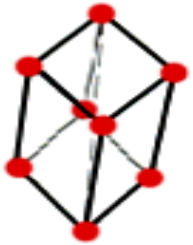
Body-centered orthorhombic



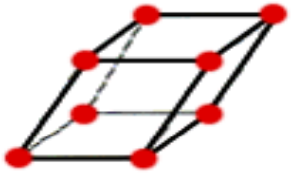
Base-centered orthorhombic



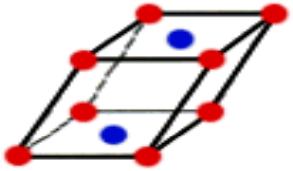
Face-centered orthorhombic



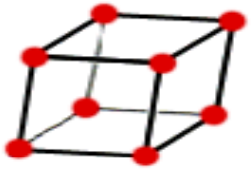
Rhombohedral



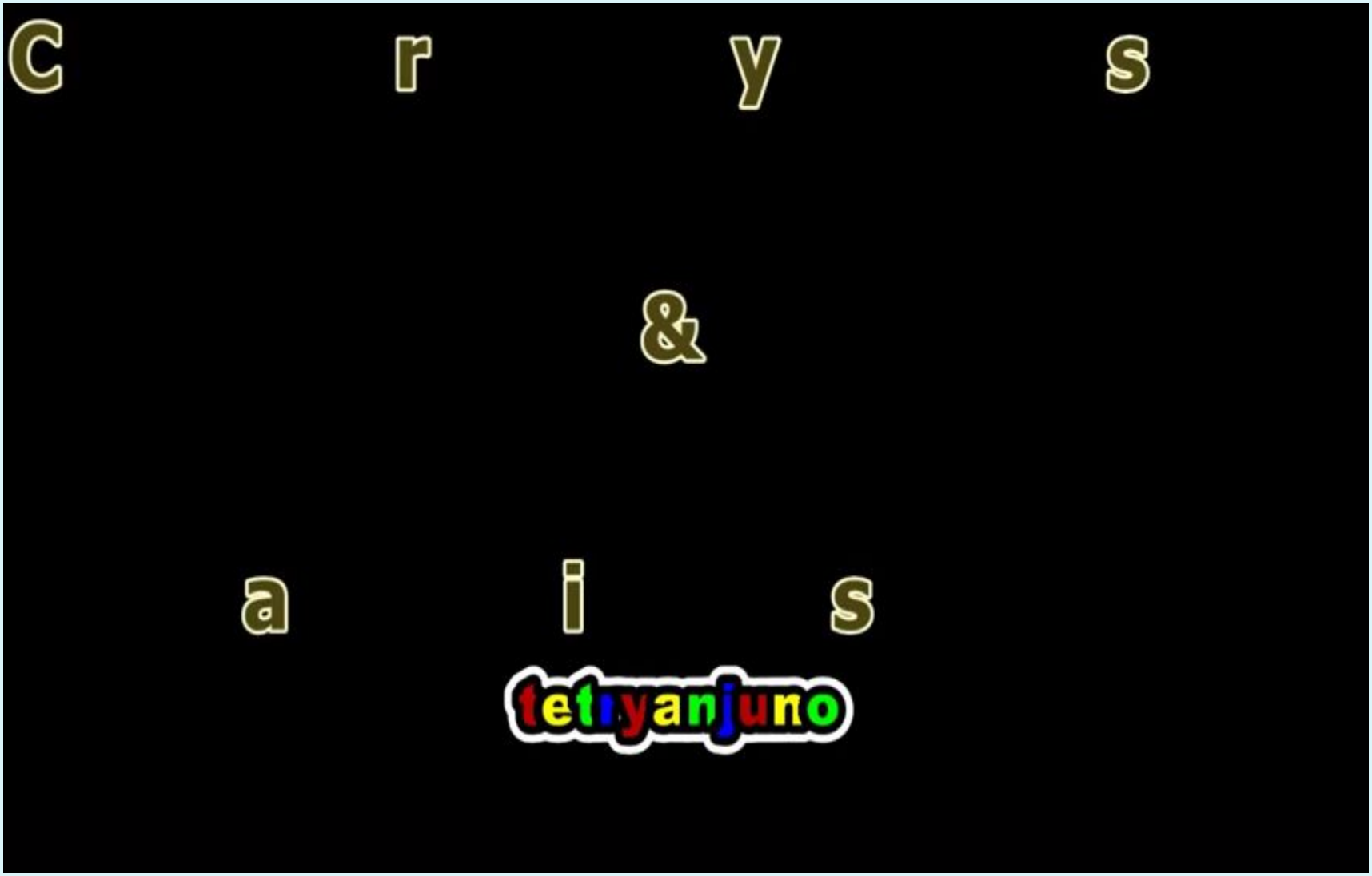
Simple Monoclinic



Base-centered monoclinic



Triclinic


C r y s
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a i s
tetyanjuno

Thank You