

Symmetry Classification for Serial Crystallography Experiments

Groups with white backgrounds are merohedral and will exhibit indexing ambiguities. Chiral groups are shown in bold, centrosymmetric groups are underlined.

Move downwards or follow grey arrows to find supergroups which can be accessed with only rotation operations. Do not cross vertical or thick black horizontal lines unless following a grey arrow. When you reach a cell with a shaded background, you have found the corresponding "source symmetry". A partial ambiguity resolution could be attempted into any intermediate group you can reach.

Point Groups	Space Groups
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Triclinic lattice

1	$\bar{1}$	P1	$P\bar{1}$
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Monoclinic lattice

	m		Pm, Pc, Cm, Cc
2	$\underline{2/m}$	P2, P2 ₁ , C2	$\underline{P2/m}$, $\underline{P2_1/m}$, $\underline{C2/m}$, $\underline{P2/c}$, $\underline{P2_1/c}$, $\underline{C2/c}$

Orthorhombic lattice

	mm2		Pmm2, Pmc2 ₁ , Pcc2, Pma2, Pca2 ₁ , Pnc2, Pmn2 ₁ , Pba2, Pna2 ₁ , Pnn2, Cmm2, Cmc2 ₁ , Ccc2, Amm2, Aem2, Ama2, Aea2, Fmm2, Fdd2, Imm2, Iba2, Ima2
222	\underline{mmm}	P222, P222 ₁ , P2 ₁ 2 ₁ 2, P2 ₁ 2 ₁ 2 ₁ , C222 ₁ , C222, F222, I222, I2 ₁ 2 ₁ 2 ₁	\underline{Pmmm} , \underline{Pnnn} , \underline{Pccm} , \underline{Pban} , \underline{Pmma} , \underline{Pnna} , \underline{Pmna} , \underline{Pcca} , \underline{Pbam} , \underline{Pccn} , \underline{Pbcm} , \underline{Pnnm} , \underline{Pmnn} , \underline{Pbcn} , \underline{Pbca} , \underline{Pnma} , \underline{Cmcm} , \underline{Cmce} , \underline{Cmmm} , \underline{Cccm} , \underline{Cmme} , \underline{Ccce} , \underline{Fmmm} , \underline{Fddd} , \underline{Immm} , \underline{Ibam} , \underline{Ibca} , \underline{Imma}

Tetragonal lattice

4	$\bar{4}$			4mm	P4, P4 ₁ , P4 ₂ , P4 ₃ , I4, I4 ₁	P4, I4			P4mm, P4bm, P4 ₂ cm, P4 ₂ nm, P4cc, P4nc, P4 ₂ mc, P4 ₂ bc, I4mm, I4cm, I4 ₁ md, I4 ₁ cd
	$\bar{4}2m$	$\bar{4}m2$	$\underline{4/m}$			P4 ₂ m, P4 ₂ c, P4 ₂ m, P4 ₂ c, I4 ₂ m, I4 ₂ d	P4m2, P4c2, P4b2, P4n2, I4m2, I4c2	$\underline{P4/m}$, $\underline{P4_2/m}$, $\underline{P4/n}$, $\underline{P4_2/n}$, $\underline{I4/m}$, $\underline{I4/a}$	
422	$\underline{4/mmm}$				P422, P42 ₁ 2, P4 ₁ 22, P4 ₁ 2 ₁ 2, P4 ₂ 22, P4 ₂ 2 ₁ 2, P4 ₃ 22, P4 ₃ 2 ₁ 2, I422, I4 ₁ 22	$\underline{P4/mmm}$, $\underline{P4/mcc}$, $\underline{P4/nbm}$, $\underline{P4/nnc}$, $\underline{P4/mbm}$, $\underline{P4/mnc}$, $\underline{P4/nmm}$, $\underline{P4/ncc}$, $\underline{P4_2/mmc}$, $\underline{P4_2/mcm}$, $\underline{P4_2/nbc}$, $\underline{P4_2/nnm}$, $\underline{P4_2/mbc}$, $\underline{P4_2/mnm}$, $\underline{P4_2/nmc}$, $\underline{P4_2/ncm}$, $\underline{I4/mmm}$, $\underline{I4/mcm}$, $\underline{I4_1/amd}$, $\underline{I4_1/acd}$			

Rhombohedral lattice

3	$\bar{3}$	3m	R3 (H3)	$\underline{R\bar{3}}$ (H $\bar{3}$)	R3m (H3m), R3c (H3c)
32	$\underline{3m}$		R32 (H32)	$\underline{R\bar{3}m}$ (H $\bar{3}m$), $\underline{R\bar{3}c}$ (H $\bar{3}c$)	

Hexagonal lattice

3			$\bar{3}$				P3, P3₁, P3₂			$\bar{P}3$										
6	312	321	3m1			$\bar{6}$	31m					P3m1, P3c1			$\bar{P}6$	P31m, P31c		P6mm, P6cc, P6 ₃ cm, P6 ₃ mc		
			$\bar{3}m1$	$\bar{6}m2$	$\bar{6}2m$	$\bar{3}1m$	$\bar{6}/m$	6mm			$\bar{P}3m1, \bar{P}3c1$			$\bar{P}6m2, \bar{P}6c2$	$\bar{P}62m, \bar{P}62c$		$\bar{P}31m, \bar{P}31c$		$\bar{P}6/m, \bar{P}6_3/m$	
622			$\bar{6}/mmm$				P6₂2, P6₁22, P6₅22, P6₄22, P6₃22			P6/mmm, P6/mcc, P6₃/mcm, P6₃/mmc										

Cubic lattice

23	$\bar{4}3m$	$m\bar{3}$	P23, F23, I23, P2₁3, I2₁3	$\bar{P}43m, \bar{F}43m, \bar{I}43m, \bar{P}43n, \bar{F}43c, \bar{I}43d$	$\bar{P}m\bar{3}, \bar{P}n\bar{3}, \bar{F}m\bar{3}, \bar{F}d\bar{3}, \bar{I}m\bar{3}, \bar{P}a\bar{3}, \bar{I}a\bar{3}$
432	$m\bar{3}m$		P432, P4₂32, F432, F4₁32, I432, P4₃32, P4₁32, I4₁32	$\bar{P}m\bar{3}m, \bar{P}n\bar{3}n, \bar{P}m\bar{3}n, \bar{P}n\bar{3}m, \bar{F}m\bar{3}m, \bar{F}m\bar{3}c, \bar{F}d\bar{3}m, \bar{F}d\bar{3}c, \bar{I}m\bar{3}m, \bar{I}a\bar{3}d$	

Laue Classes

$\bar{1}$	$\bar{1}$			
$2/m$	2	m		
mmm	222	mm2		
$4/m$	4	$\bar{4}$		
$4/mmm$	422	$\bar{4}2m$	$\bar{4}m2$	4mm

$\bar{3}$	3	
$\bar{3}m$	32	3m
$\bar{3}m1$	321	3m1
$\bar{3}1m$	312	31m

$\bar{6}/m$	6			$\bar{6}$
$\bar{6}/mmm$	622	$\bar{6}m2$	$\bar{6}2m$	6mm
$m\bar{3}$	23			
$m\bar{3}m$	432	$\bar{4}3m$		