

Symmetry Classification for Serial Crystallography Experiments

Groups with white backgrounds are merohedral and will exhibit indexing ambiguities. Move directly downwards to the nearest cell with a shaded background to find the corresponding “source symmetry”.
Do not cross thick black lines. Chiral groups are shown in bold, centrosymmetric groups are underlined.

Point Groups					Space Groups				
Triclinic lattice									
$\bar{1}$		1		$P\bar{1}$			P1		
Monoclinic lattice									
2		m		P2, P2 ₁ , C2			Pm, Pc, Cm, Cc		
		<u>2/m</u>					<u>P2/m, P2₁/m, C2/m, P2/c, P2₁/c, C2/c</u>		
Orthorhombic lattice									
222		mm2		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			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		
		<u>mmm</u>					<u>Pmmm, Pnnn, Pccm, Pban, Pmma, Pnna, Pmna, Pcca, Pbam, Pccn, Pbcm, Pnnm, Pmmn, Pbcn, Pbca, Pnma, Cmcn, Cmce, Cmmm, Cccm, Cmme, Ccce, Fmmm, Fddd, Immm, Ibam, Ibca, Imma</u>		
Tetragonal lattice									
4	$\bar{4}$			<u>4/m</u>	P4, P4 ₁ , P4 ₂ , P4 ₃ , I4, I4 ₁	$P\bar{4}, I\bar{4}$			<u>P4/m, P4₂/m, P4/n, P4₂/n, I4/m, I4₁/a</u>
422	$\bar{4}2m$	$\bar{4}m2$	4mm		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	$P\bar{4}2m, P\bar{4}2c, P\bar{4}2_1m, P\bar{4}2_1c, I\bar{4}2m, I\bar{4}2d$	$P\bar{4}m2, P\bar{4}c2, P\bar{4}b2, P\bar{4}n2, I\bar{4}m2, I\bar{4}c2$	P4mm, P4bm, P4 ₂ cm, P4 ₂ nm, P4cc, P4nc, P4 ₂ mc, P4 ₂ bc, I4mm, I4cm, I4 ₁ md, I4 ₁ cd	
	<u>4/mmm</u>					<u>P4/mmm, P4/mcc, P4/nbm, P4/nnc, P4/mbm, P4/mnc, P4/nmm, P4/ncc, P4₂/mmc, P4₂/mcm, P4₂/nbc, P4₂/nnm, P4₂/mbc, P4₂/mnm, P4₂/nmc, P4₂/ncm, I4/mmm, I4/mcm, I4₁/amd, I4₁/acd</u>			

Rhombohedral lattice

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

Hexagonal lattice

6	3		$\bar{3}$				6mm	$\frac{6}{m}$	P6, P6 ₁ , P6 ₅ , P6 ₂ , P6 ₄ , P6 ₃	P3, P3 ₁ , P3 ₂		$P\bar{3}$				P6mm, P6cc, P6 ₃ cm, P6 ₃ mc	$\frac{P6}{m}$, $\frac{P6_3}{m}$
	312	321								P312, P3 ₁ 12, P3 ₂ 12	P321, P3 ₁ 21, P3 ₂ 21						
			$\bar{3}m1$	$\bar{6}m2$	$\bar{6}2m$	$\bar{3}1m$						$\frac{P\bar{3}m1}{P\bar{3}c1}$	$\frac{P\bar{6}m2}{P\bar{6}c2}$	$\frac{P\bar{6}2m}{P\bar{6}2c}$	$\frac{P\bar{3}1m}{P\bar{3}1c}$		
622		$\frac{6}{mmm}$						P622, P6 ₁ 22, P6 ₅ 22, P6 ₂ 22, P6 ₄ 22, P6 ₃ 22		$\frac{P6}{mmm}$, $\frac{P6}{mcc}$, $\frac{P6_3}{mcm}$, $\frac{P6_3}{mmc}$							

Cubic lattice

23		$m\bar{3}$	P23, F23, I23, P2 ₁ 3, I2 ₁ 3		$Pm\bar{3}$, $Pn\bar{3}$, $Fm\bar{3}$, $Fd\bar{3}$, $Im\bar{3}$, $Pa\bar{3}$, $Ia\bar{3}$
432	$\bar{4}32$		P432, P4 ₂ 32, F432, F4 ₁ 32, I432, P4 ₃ 32, P4 ₁ 32, I4 ₁ 32	P $\bar{4}$ 3m, F $\bar{4}$ 3m, I $\bar{4}$ 3m, P $\bar{4}$ 3n, F $\bar{4}$ 3c, I $\bar{4}$ 3d	
	$m\bar{3}m$				$\frac{Pm\bar{3}m}{Fd\bar{3}m}$, $\frac{Pn\bar{3}n}{Fd\bar{3}c}$, $\frac{Pm\bar{3}n}{Im\bar{3}m}$, $\frac{Pn\bar{3}m}{Ia\bar{3}d}$, $\frac{Fm\bar{3}m}{Ia\bar{3}d}$, $\frac{Fm\bar{3}c}{Ia\bar{3}d}$

Laue Classes

$\bar{1}$	$\bar{1}$			
$\frac{2}{m}$	2	m		
mmm	222	mm2		
$\frac{4}{m}$	4	$\bar{4}$		
$\frac{4}{mmm}$	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

$\frac{6}{m}$	6	$\bar{6}$	
$\frac{6}{mmm}$	622	$\bar{6}m2$	$\bar{6}2m$ 6mm
$m\bar{3}$	23		
$m\bar{3}m$	432	$\bar{4}32$	