

NANO106 Handout 5 - The 32 Crystallographic Point Groups

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Crystal System	Laue Class	Hermann-Mauguin Full	Hermann-Mauguin Short	Schoenflies
Triclinic	$\bar{1}$	$\bar{1}$	$\bar{1}$	C_1 $C_i = S_2$
Monoclinic	$\frac{2}{m}$	$\frac{2}{m}$	$\frac{2}{m}$	C_2 $C_s = C_{1h}$ C_{2h}
Orthorhombic	mmm	$\frac{222}{m\ m\ m}$	$\frac{222}{mmm}$	D_2 C_{2v} D_{2h}
Tetragonal	$\frac{4}{m}$	$\frac{4}{m}$	$\frac{4}{m}$	C_4 S_4 C_{4h}
	$\frac{4}{m}mm$	$\frac{422}{4mm\ 42m\ 4\ 2\ 2\ m\ m\ m}$	$\frac{422}{4mm\ 42m\ 4\ 2\ 2\ m\ m\ m}$	D_4 C_{4v} D_{2d} D_{4h}
Trigonal	$\bar{3}$	$\frac{3}{\bar{3}}$	$\frac{3}{\bar{3}}$	C_3 C_{3i}
	$\bar{3}m$	$\frac{32}{3m\ \bar{3}m}$	$\frac{32}{3m\ \bar{3}m}$	D_3 C_{3v} D_{3d}
Hexagonal	$\frac{6}{m}$	$\frac{6}{m}$	$\frac{6}{m}$	C_6 C_{3h} C_{6h}
	$\frac{6}{m}mm$	$\frac{622}{6mm\ 6m2\ 6\ 2\ 2\ m\ m\ m}$	$\frac{622}{6mm\ 6m2\ 6\ 2\ 2\ m\ m\ m}$	D_6 C_{6v} D_{3h} D_{6h}
Cubic	$m\bar{3}$	$\frac{23}{m\ \bar{3}}$	$\frac{23}{m\bar{3}}$	T T_h
	$m\bar{3}m$	$\frac{432}{\bar{4}3m\ 4\ \bar{3}\ 2\ m\ m}$	$\frac{432}{\bar{4}3m\ 4\ \bar{3}\ 2\ m\ m}$	O T_d O_h