Table of crystal classes in 2-D

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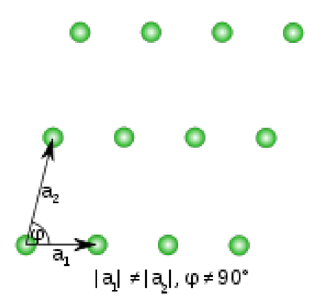
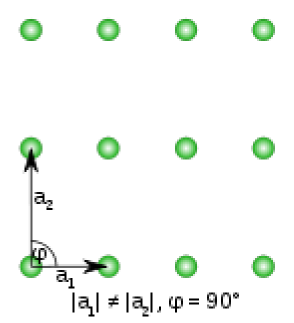
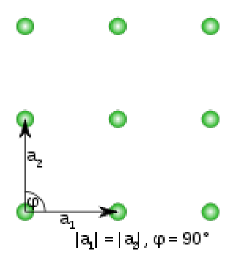
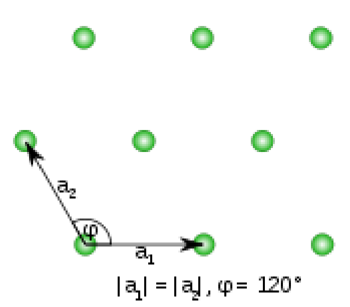
Crystal system	***International symbol***	***Short Hermann-Mauguin symbol***	***Plane groups***	***Number of symmetry elements***	***Independent components of rank 2 tensors***	***Generating matrices***	***Group elements***
Oblique 	1	p1	1	1	$\begin{bmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{bmatrix}$	E = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$	$E = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
	2	p2	2	2	$\begin{bmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{bmatrix}$	$2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$	$E, 2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$
Rectangular 	m	pm	3-5	2	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{22} \end{bmatrix}$	$m(0,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	E, $m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$
	2mm	p2mm	6-9	4	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{22} \end{bmatrix}$	$2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	$E, m(x,0) = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}, 2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$
Square 	4	p4	10	4	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{11} \end{bmatrix}$	$2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, 4^+ = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$	E, $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}, 2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, 4^+ = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$
	4mm	p4mm	11-12	8	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{11} \end{bmatrix}$	$4^+ = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}, m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	$E, 2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, 4^- = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}, m(x,0) = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}, m(x,x) = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, m(x,\bar{x}) = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}, 4^+ = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}, m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$
Hexagonal 	3	p3	13	3	$\begin{bmatrix} g_{11} & g_{12} \\ -g_{12} & g_{11} \end{bmatrix}$	$3^- = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}$	$E, 3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, 3^- = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}$
	3m	p3m1	14	6	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{11} \end{bmatrix}$	$3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,\bar{x}) = \begin{bmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}$	$E, 3^- = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, 3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,\bar{x}) = \begin{bmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,2x) = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}, m(2x,x) = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}$
		p31m	15	6	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{11} \end{bmatrix}$	$3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,x) = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$	$E, 3^- = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}, m(x,0) = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}, 3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,x) = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$
	6	p6	16	6	$\begin{bmatrix} g_{11} & g_{12} \\ -g_{12} & g_{11} \end{bmatrix}$	$6^+ = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$	$E, 3^- = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, 3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, 2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, 6^+ = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}, 6^- = \begin{bmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$
	6mm	p6mm	17	12	$\begin{bmatrix} g_{11} & 0 \\ 0 & g_{11} \end{bmatrix}$	$6^+ = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}, m(x,\bar{x}) = \begin{bmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}$	$E, 3^- = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, 3^+ = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, 2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, 6^+ = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}, 6^- = \begin{bmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}, m(x,2x) = \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix},$ $m(2x,x) = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,\bar{x}) = \begin{bmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}, m(x,x) = \begin{bmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}, m(o,y) = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}, m(x,0) = \begin{bmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$