

Character Table 9
The Cubic Groups

T (23)	E	$4C_3$	$4C_3^2$	$3C_2$				$\varepsilon = \exp(2\pi i/3)$
A	1	1	1	1				$x^2 + y^2 + z^2$
E	$\begin{Bmatrix} 1 & \varepsilon & \varepsilon^* & 1 \\ 1 & \varepsilon^* & \varepsilon & 1 \end{Bmatrix}$	ε	ε^*	ε				$(\sqrt{3}(x^2 - y^2), 2z^2 - x^2 - y^2)$
T	3	0	0	-1	(x, y, z) (R_x, R_y, R_z)			(xy, xz, yz)

T_d (43m)	E	$8C_3$	$3C_2$	$6S_4$	$6\sigma_d$				
A ₁	1	1	1	1	1				$x^2 + y^2 + z^2$
A ₂	1	1	1	-1	-1				
E	2	-1	2	0	0				$(2z^2 - x^2 - y^2, \sqrt{3}(x^2 - y^2))$
T ₁	3	0	-1	1	-1	(R_x, R_y, R_z)			
T ₂	3	0	-1	-1	1	(x, y, z)			(xy, xz, yz)

T_h (m3)	E	$4C_3$	$4C_3^2$	$3C_2$	i	$4S_6$	$4S_6^2$	$3\sigma_d$	$\varepsilon = \exp(2\pi i/3)$	
A _g	1	1	1	1	1	1	1	1	$x^2 + y^2 + z^2$	
E _g	$\begin{Bmatrix} 1 & \varepsilon & \varepsilon^* & 1 & 1 & \varepsilon & \varepsilon^* & 1 \\ 1 & \varepsilon^* & \varepsilon & 1 & 1 & \varepsilon^* & \varepsilon & 1 \end{Bmatrix}$	ε	ε^*	ε	ε	ε^*	ε	ε^*	$(2z^2 - x^2 - y^2, \sqrt{3}(x^2 - y^2))$	
T _g	3	0	0	-1	3	0	0	-1	(R_x, R_y, R_z)	(xy, yz, xz)
A _u	1	1	1	1	-1	-1	-1	-1		
E _u	$\begin{Bmatrix} 1 & \varepsilon & \varepsilon^* & 1 & -1 & -\varepsilon & -\varepsilon^* & -1 \\ 1 & \varepsilon^* & \varepsilon & 1 & -1 & -\varepsilon^* & -\varepsilon & -1 \end{Bmatrix}$	ε	ε^*	ε	ε	ε^*	ε	ε^*		
T _u	3	0	0	-1	-3	0	0	1	(x, y, z)	

O (432)	E	$8C_3$	$3C_2$	$6C_4$	$6C_2'$				
A ₁	1	1	1	1	1				$x^2 + y^2 + z^2$
A ₂	1	1	1	-1	-1				
E	2	-1	2	0	0				$(2z^2 - x^2 - y^2, \sqrt{3}(x^2 - y^2))$
T ₁	3	0	-1	1	-1	(x, y, z) (R_x, R_y, R_z)			
T ₂	3	0	-1	-1	1			(xy, xz, yz)	

Character Table 9 (cont...)

The Cubic Groups

O_h ($m3m$)	E	$8C_3$	$6C_2$	$6C_4$	$3C_2$ ($= C_4^2$)	i	$6S_4$	$8S_6$	$3\sigma_h$	$6\sigma_d$	
A_{1g}	1	1	1	1	1	1	1	1	1	1	$x^2 + y^2 + z^2$
A_{2g}	1	1	-1	-1	1	1	-1	1	1	-1	
E_g	2	-1	0	0	2	2	0	-1	2	0	$(2z^2 - x^2 - y^2,$ $\sqrt{3}(x^2 - y^2))$
T_{1g}	3	0	-1	1	-1	3	1	0	-1	-1	(R_x, R_y, R_z)
T_{2g}	3	0	1	-1	-1	3	-1	0	-1	1	(xy, xz, yz)
A_{1u}	1	1	1	1	1	-1	-1	-1	-1	-1	
A_{2u}	1	1	-1	-1	1	-1	1	-1	-1	1	
E_u	2	-1	0	0	2	-2	0	1	-2	0	
T_{1u}	3	0	-1	1	-1	-3	-1	0	1	1	(x, y, z)
T_{2u}	3	0	1	-1	-1	-3	1	0	1	-1	