PG No. 2 C_{i} $\bar{1}$ [triclinic] (axial, internal polar dipole)

* Harmonics for rank 0

* Harmonics for rank 1

$\vec{\mathbb{G}}_1^{(1,0)}[q](A_g,1)$

** symmetry

$$x$$

** expression

$$\frac{\sqrt{2}Q_y z}{2} - \frac{\sqrt{2}Q_z y}{2}$$

$\vec{\mathbb{G}}_1^{(1,0)}[q](A_g,2)$

** symmetry

$$y$$

** expression

$$-\frac{\sqrt{2}Q_x z}{2} + \frac{\sqrt{2}Q_z x}{2}$$

$\vec{\mathbb{G}}_1^{(1,0)}[q](A_g,3)$

** symmetry

$$z$$

** expression

$$\frac{\sqrt{2}Q_x y}{2} - \frac{\sqrt{2}Q_y x}{2}$$

* Harmonics for rank 2

$\vec{\mathbb{G}}_2^{(1,0)}[q](A_u,1)$

** symmetry

$$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$$

** expression

$$\frac{\sqrt{6}Q_x yz}{2} - \frac{\sqrt{6}Q_y xz}{2}$$

$\vec{\mathbb{G}}_2^{(1,0)}[q](A_u,2)$

** symmetry

$$\frac{\sqrt{3}\left(x-y\right)\left(x+y\right)}{2}$$

** expression

$$\frac{\sqrt{2}Q_x yz}{2} + \frac{\sqrt{2}Q_y xz}{2} - \sqrt{2}Q_z xy$$

$\vec{\mathbb{G}}_2^{(1,0)}[q](A_u,3)$

** symmetry

$$\sqrt{3}yz$$

** expression

$$\frac{\sqrt{2}Q_x\left(y-z\right)\left(y+z\right)}{2} - \frac{\sqrt{2}Q_y xy}{2} + \frac{\sqrt{2}Q_z xz}{2}$$

$\vec{\mathbb{G}}_2^{(1,0)}[q](A_u,4)$

** symmetry

$$\sqrt{3}xz$$

** expression

$$\frac{\sqrt{2}Q_x xy}{2} - \frac{\sqrt{2}Q_y\left(x-z\right)\left(x+z\right)}{2} - \frac{\sqrt{2}Q_z yz}{2}$$

$\vec{\mathbb{G}}_2^{(1,0)}[q](A_u,5)$

** symmetry

$$\sqrt{3}xy$$

** expression

$$-\frac{\sqrt{2}Q_{x}xz}{2}+\frac{\sqrt{2}Q_{y}yz}{2}+\frac{\sqrt{2}Q_{z}\left(x-y\right)\left(x+y\right)}{2}$$

* Harmonics for rank 3
$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,1)$
** symmetry

$$\sqrt{15}xyz$$

** expression

$$\frac{\sqrt{5}Q_{x}x\left(y-z\right)\left(y+z\right)}{2}-\frac{\sqrt{5}Q_{y}y\left(x-z\right)\left(x+z\right)}{2}+\frac{\sqrt{5}Q_{z}z\left(x-y\right)\left(x+y\right)}{2}$$

$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,2)$
** symmetry

$$\frac{x\left(2x^{2}-3y^{2}-3z^{2}\right)}{2}$$

** expression

$$\frac{\sqrt{3}Q_{y}z\left(4x^{2}-y^{2}-z^{2}\right)}{4}-\frac{\sqrt{3}Q_{z}y\left(4x^{2}-y^{2}-z^{2}\right)}{4}$$

$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,3)$
** symmetry

$$-\frac{y\left(3x^{2}-2y^{2}+3z^{2}\right)}{2}$$

** expression

$$\frac{\sqrt{3}Q_{x}z\left(x^{2}-4y^{2}+z^{2}\right)}{4}-\frac{\sqrt{3}Q_{z}x\left(x^{2}-4y^{2}+z^{2}\right)}{4}$$

$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,4)$
** symmetry

$$-\frac{z\left(3x^{2}+3y^{2}-2z^{2}\right)}{2}$$

** expression

$$-\frac{\sqrt{3}Q_{x}y\left(x^{2}+y^{2}-4z^{2}\right)}{4}+\frac{\sqrt{3}Q_{y}x\left(x^{2}+y^{2}-4z^{2}\right)}{4}$$

$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,5)$
** symmetry

$$\frac{\sqrt{15}x\left(y-z\right)\left(y+z\right)}{2}$$

** expression

$$-\sqrt{5}Q_{x}xyz+\frac{\sqrt{5}Q_{y}z\left(2x^{2}+y^{2}-z^{2}\right)}{4}+\frac{\sqrt{5}Q_{z}y\left(2x^{2}-y^{2}+z^{2}\right)}{4}$$

$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,6)$
** symmetry

$$-\frac{\sqrt{15}y\left(x-z\right)\left(x+z\right)}{2}$$

** expression

$$\frac{\sqrt{5}Q_{x}z\left(x^{2}+2y^{2}-z^{2}\right)}{4}-\sqrt{5}Q_{y}xyz-\frac{\sqrt{5}Q_{z}x\left(x^{2}-2y^{2}-z^{2}\right)}{4}$$

$\vec{\mathbb{G}}_{3}^{(1,0)}[q](A_g,7)$
** symmetry

$$\frac{\sqrt{15}z\left(x-y\right)\left(x+y\right)}{2}$$

** expression

$$\frac{\sqrt{5}Q_{x}y\left(x^{2}-y^{2}+2z^{2}\right)}{4}-\frac{\sqrt{5}Q_{y}x\left(x^{2}-y^{2}-2z^{2}\right)}{4}-\sqrt{5}Q_{z}xyz$$

* Harmonics for rank 4

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,1)$

** symmetry

$$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$$

** expression

$$-\frac{\sqrt{105}Q_xyz\left(y-z\right)\left(y+z\right)}{6}+\frac{\sqrt{105}Q_yxz\left(x-z\right)\left(x+z\right)}{6}-\frac{\sqrt{105}Q_zxy\left(x-y\right)\left(x+y\right)}{6}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,2)$

** symmetry

$$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$$

** expression

$$-\frac{\sqrt{3}Q_xyz\left(9x^2+2y^2-5z^2\right)}{6}+\frac{\sqrt{3}Q_yxz\left(2x^2+9y^2-5z^2\right)}{6}+\frac{7\sqrt{3}Q_zxy\left(x-y\right)\left(x+y\right)}{6}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,3)$

** symmetry

$$\frac{\sqrt{5}\left(x-y\right)\left(x+y\right)\left(x^2+y^2-6z^2\right)}{4}$$

** expression

$$-\frac{Q_xyz\left(3x^2-4y^2+3z^2\right)}{2}+\frac{Q_yxz\left(4x^2-3y^2-3z^2\right)}{2}-\frac{Q_zxy\left(x^2+y^2-6z^2\right)}{2}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,4)$

** symmetry

$$\frac{\sqrt{35}yz\left(y-z\right)\left(y+z\right)}{2}$$

** expression

$$\frac{\sqrt{7}Q_x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{4}-\frac{\sqrt{7}Q_yxy\left(y^2-3z^2\right)}{4}+\frac{\sqrt{7}Q_zxz\left(3y^2-z^2\right)}{4}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,5)$

** symmetry

$$-\frac{\sqrt{35}xz\left(x-z\right)\left(x+z\right)}{2}$$

** expression

$$-\frac{\sqrt{7}Q_xxy\left(x^2-3z^2\right)}{4}+\frac{\sqrt{7}Q_y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{4}+\frac{\sqrt{7}Q_zyz\left(3x^2-z^2\right)}{4}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,6)$

** symmetry

$$\frac{\sqrt{35}xy\left(x-y\right)\left(x+y\right)}{2}$$

** expression

$$-\frac{\sqrt{7}Q_xxz\left(x^2-3y^2\right)}{4}+\frac{\sqrt{7}Q_yyz\left(3x^2-y^2\right)}{4}+\frac{\sqrt{7}Q_z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{4}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,7)$

** symmetry

$$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$$

** expression

$$\frac{Q_x\left(y-z\right)\left(y+z\right)\left(6x^2-y^2-z^2\right)}{4}-\frac{Q_yxy\left(6x^2-y^2-15z^2\right)}{4}+\frac{Q_zxz\left(6x^2-15y^2-z^2\right)}{4}$$

$\vec{\mathbb{G}}_4^{(1,0)}[q](A_u,8)$

** symmetry

$$-\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$$

** expression

$$-\frac{Q_{x} x y \left(x^{2} - 6 y^{2} + 15 z^{2}\right)}{4} + \frac{Q_{y} \left(x - z\right) \left(x + z\right) \left(x^{2} - 6 y^{2} + z^{2}\right)}{4} + \frac{Q_{z} y z \left(15 x^{2} - 6 y^{2} + z^{2}\right)}{4}$$

$\vec{\mathbb{G}}_{4}^{(1,0)}[q](A_u,9)$
** symmetry

$$-\frac{\sqrt{5} x y \left(x^{2} + y^{2} - 6 z^{2}\right)}{2}$$

** expression

$$\frac{Q_{x} x z \left(x^{2} + 15 y^{2} - 6 z^{2}\right)}{4} - \frac{Q_{y} y z \left(15 x^{2} + y^{2} - 6 z^{2}\right)}{4} - \frac{Q_{z} \left(x - y\right) \left(x + y\right) \left(x^{2} + y^{2} - 6 z^{2}\right)}{4}$$