

MPG No. 4.1.9 m [Type I, monoclinic] [G tensor]

* Rank 0 tensor. * Rank 1 tensor.

$$\begin{bmatrix} 0 & G_y & 0 \end{bmatrix}$$

$$G_y = G_{py}^{(1)}$$

* Rank 2 tensor (s).

$$\begin{bmatrix} 0 & G_{xy} & 0 \\ G_{xy} & 0 & G_{yz} \\ 0 & G_{yz} & 0 \end{bmatrix}$$

$$G_{xy} = G_{dxy}^{(1)}$$

$$G_{yz} = G_{dyz}^{(1)}$$

* Rank 2 tensor (a).

$$\begin{bmatrix} 0 & G_{xy} & 0 \\ -G_{xy} & 0 & G_{yz} \\ 0 & -G_{yz} & 0 \end{bmatrix}$$

$$G_{xy} = Q_{pz}^{(1)}$$

$$G_{yz} = Q_{px}^{(1)}$$

* Rank 3 tensor (s).

$$\begin{bmatrix} 0 & G_{xxy} & 0 \\ 0 & G_{yy} & 0 \\ 0 & G_{zzy} & 0 \\ G_{yzz} & 0 & G_{yzz} \\ 0 & G_{zxy} & 0 \\ G_{xyx} & 0 & G_{xyz} \end{bmatrix}$$

$$G_{xxy} = -G_{fay}^{(1)} - G_{fb}^{(1)} + G_{py}^{(1)} + 2Q_{dxz}^{(1)}$$

$$G_{yyy} = 2G_{fay}^{(1)} + G_{py}^{(1)} + 2G_{py}^{(2)}$$

$$G_{zzy} = -G_{fay}^{(1)} + G_{fb}^{(1)} + G_{py}^{(1)} - 2Q_{dxz}^{(1)}$$

$$G_{yzz} = G_{f3}^{(1)} - 3Q_{du}^{(1)} - Q_{dv}^{(1)}$$

$$G_{yzz} = -G_{fay}^{(1)} + G_{fb}^{(1)} + G_{py}^{(2)} + Q_{dxz}^{(1)}$$

$$G_{zxy} = G_{f3}^{(1)} + 3Q_{du}^{(1)} - Q_{dv}^{(1)}$$

$$G_{xyx} = -G_{fay}^{(1)} - G_{fb}^{(1)} + G_{py}^{(2)} - Q_{dxz}^{(1)}$$

$$G_{xyz} = G_{f3}^{(1)} + 2Q_{dv}^{(1)}$$

* Rank 3 tensor (a).

$$\begin{bmatrix} G_{yzz} & 0 & G_{yzz} \\ 0 & G_{zxy} & 0 \\ G_{xyx} & 0 & G_{xyz} \end{bmatrix}$$

$$G_{yzz} = -Q_{du}^{(2)} + Q_{dv}^{(2)} + Q_s^{(1)}$$

$$G_{yzz} = -G_{py}^{(3)} + Q_{dxz}^{(2)}$$

$$G_{zxy} = -Q_{du}^{(2)} - Q_{dv}^{(2)} + Q_s^{(1)}$$

$$G_{xyx} = G_{py}^{(3)} + Q_{dxz}^{(2)}$$

$$G_{xyz} = 2Q_{du}^{(2)} + Q_s^{(1)}$$

* Rank 4 tensor (sss).

$$\begin{bmatrix} 0 & 0 & 0 & G_{xxyz} & 0 & G_{xxxy} \\ 0 & 0 & 0 & G_{yyyz} & 0 & G_{yyxy} \\ 0 & 0 & 0 & G_{zzyz} & 0 & G_{zzxy} \\ G_{xxyz} & G_{yyyz} & G_{zzyz} & 0 & G_{yzzx} & 0 \\ 0 & 0 & 0 & G_{yzzx} & 0 & G_{zxxxy} \\ G_{xxxy} & G_{yyxy} & G_{zzxy} & 0 & G_{zxxxy} & 0 \end{bmatrix}$$

$$G_{xxyz} = G_{dyz}^{(1)} + 2G_{gbx}^{(1)}$$

$$G_{xxxy} = G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{gaz}^{(1)} - G_{gbz}^{(1)}$$

$$G_{yyyz} = G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{gax}^{(1)} - G_{gbx}^{(1)}$$

$$G_{yyxy} = G_{dxy}^{(1)} + 2G_{dxy}^{(2)} - G_{gaz}^{(1)} - G_{gbz}^{(1)}$$

$$G_{zzyz} = G_{dyz}^{(1)} + 2G_{dyz}^{(2)} - G_{gax}^{(1)} - G_{gbx}^{(1)}$$

$$G_{zzxy} = G_{dxy}^{(1)} + 2G_{gbz}^{(1)}$$

$$G_{yzzx} = G_{dxy}^{(2)} + 2G_{gbz}^{(1)}$$

$$G_{zxxxy} = G_{dyz}^{(2)} + 2G_{gbx}^{(1)}$$

* Rank 4 tensor (ssa).

$$\begin{bmatrix} 0 & 0 & 0 & G_{xxyz} & 0 & G_{xxxy} \\ 0 & 0 & 0 & G_{yyyz} & 0 & G_{yyxy} \\ 0 & 0 & 0 & G_{zzyz} & 0 & G_{zzxy} \\ -G_{xxyz} & -G_{yyyz} & -G_{zzyz} & 0 & G_{yzzx} & 0 \\ 0 & 0 & 0 & -G_{yzzx} & 0 & G_{zxxxy} \\ -G_{xxxy} & -G_{yyxy} & -G_{zzxy} & 0 & -G_{zxxxy} & 0 \end{bmatrix}$$

$$G_{xxyz} = G_{dyz}^{(3)} - 4Q_{fbx}^{(1)}$$

$$G_{xxxy} = G_{dxy}^{(3)} - 2Q_{faz}^{(1)} + 2Q_{fbz}^{(1)} + 2Q_{pz}^{(1)}$$

$$G_{yyyz} = G_{dyz}^{(3)} - 2Q_{fax}^{(1)} + 2Q_{fbx}^{(1)} + 2Q_{px}^{(1)}$$

$$G_{yyxy} = G_{dxy}^{(3)} + 2Q_{faz}^{(1)} + 2Q_{fbz}^{(1)} - 2Q_{pz}^{(1)}$$

$$G_{zzyz} = G_{dyz}^{(3)} + 2Q_{fax}^{(1)} + 2Q_{fbx}^{(1)} - 2Q_{px}^{(1)}$$

$$G_{zzxy} = G_{dxy}^{(3)} - 4Q_{fbz}^{(1)}$$

$$G_{yzzx} = -4Q_{faz}^{(1)} - Q_{pz}^{(1)}$$

$$G_{zxxxy} = -4Q_{fax}^{(1)} - Q_{px}^{(1)}$$

* Rank 4 tensor (aas).

$$\begin{bmatrix} 0 & G_{yzzx} & 0 \\ G_{yzzx} & 0 & G_{zxxxy} \\ 0 & G_{zxxxy} & 0 \end{bmatrix}$$

$$G_{yzzx} = 2G_{dxy}^{(4)}$$

$$G_{zxxxy} = 2G_{dyz}^{(4)}$$

* Rank 4 tensor (aaa).

$$\begin{bmatrix} 0 & G_{yzzx} & 0 \\ -G_{yzzx} & 0 & G_{zxxxy} \\ 0 & -G_{zxxxy} & 0 \end{bmatrix}$$

$$G_{yzzx} = -Q_{pz}^{(2)}$$

$$G_{zxxxy} = -Q_{px}^{(2)}$$

* Rank 4 tensor (sa).

$$\begin{bmatrix} G_{xxyz} & 0 & G_{xxxy} \\ G_{yyyz} & 0 & G_{yyxy} \\ G_{zzyz} & 0 & G_{zzxy} \\ 0 & G_{yzzx} & 0 \\ G_{zxyz} & 0 & G_{zxxy} \\ 0 & G_{xyzx} & 0 \end{bmatrix}$$

$$\begin{aligned} G_{xxyz} &= 2Q_{fax}^{(2)} + Q_{px}^{(3)} + 2Q_{px}^{(4)} \\ G_{xxxy} &= -2G_{dxy}^{(5)} - Q_{faz}^{(2)} + Q_{fbz}^{(2)} + Q_{pz}^{(3)} \\ G_{yyyz} &= -2G_{dyz}^{(5)} - Q_{fax}^{(2)} + Q_{fbx}^{(2)} + Q_{px}^{(3)} \\ G_{yyxy} &= 2G_{dxy}^{(5)} - Q_{faz}^{(2)} - Q_{fbz}^{(2)} + Q_{pz}^{(3)} \\ G_{zzyz} &= 2G_{dyz}^{(5)} - Q_{fax}^{(2)} - Q_{fbx}^{(2)} + Q_{px}^{(3)} \\ G_{zzxy} &= 2Q_{faz}^{(2)} + Q_{pz}^{(3)} + 2Q_{pz}^{(4)} \\ G_{yzzx} &= -G_{dxy}^{(5)} - Q_{faz}^{(2)} - Q_{fbz}^{(2)} + Q_{pz}^{(4)} \\ G_{zxyz} &= G_{dxy}^{(5)} - Q_{faz}^{(2)} + Q_{fbz}^{(2)} + Q_{pz}^{(4)} \\ G_{zxxxy} &= -G_{dyz}^{(5)} - Q_{fax}^{(2)} - Q_{fbx}^{(2)} + Q_{px}^{(4)} \\ G_{xyzx} &= G_{dyz}^{(5)} - Q_{fax}^{(2)} + Q_{fbx}^{(2)} + Q_{px}^{(4)} \end{aligned}$$

* Rank 4 tensor (as).

$$\begin{bmatrix} G_{yzxx} & G_{yzyy} & G_{yzzz} & 0 & G_{yzzx} & 0 \\ 0 & 0 & 0 & G_{zxyz} & 0 & G_{zxxy} \\ G_{xyxx} & G_{xyyy} & G_{xyzz} & 0 & G_{xyzx} & 0 \end{bmatrix}$$

$$\begin{aligned} G_{yzxx} &= 2Q_{fax}^{(3)} + Q_{px}^{(5)} + 2Q_{px}^{(6)} \\ G_{yzyy} &= -2G_{dxy}^{(6)} - Q_{faz}^{(3)} + Q_{fbx}^{(3)} + Q_{px}^{(5)} \\ G_{yzzz} &= 2G_{dyz}^{(6)} - Q_{fax}^{(3)} - Q_{fbx}^{(3)} + Q_{px}^{(5)} \\ G_{yzzx} &= G_{dxy}^{(6)} - Q_{faz}^{(3)} + Q_{fbz}^{(3)} + Q_{pz}^{(6)} \\ G_{zxyz} &= -G_{dxy}^{(6)} - Q_{faz}^{(3)} - Q_{fbz}^{(3)} + Q_{pz}^{(6)} \\ G_{zxxxy} &= G_{dyz}^{(6)} - Q_{fax}^{(3)} + Q_{fbx}^{(3)} + Q_{px}^{(6)} \\ G_{xyxx} &= -2G_{dxy}^{(6)} - Q_{faz}^{(3)} + Q_{fbz}^{(3)} + Q_{pz}^{(5)} \\ G_{xyyy} &= 2G_{dxy}^{(6)} - Q_{faz}^{(3)} - Q_{fbz}^{(3)} + Q_{px}^{(5)} \\ G_{xyzz} &= 2Q_{faz}^{(3)} + Q_{pz}^{(5)} + 2Q_{pz}^{(6)} \\ G_{xyzx} &= -G_{dyz}^{(6)} - Q_{faz}^{(3)} - Q_{fbx}^{(3)} + Q_{px}^{(6)} \end{aligned}$$

* Rank 4 tensor (s).

$$\begin{bmatrix} 0 & 0 & 0 & G_{xxyz} & 0 & G_{xxxy} & G_{xxzy} & 0 & G_{xxyx} \\ 0 & 0 & 0 & G_{yyyz} & 0 & G_{yyxy} & G_{yyzy} & 0 & G_{yyyx} \\ 0 & 0 & 0 & G_{zzyz} & 0 & G_{zzxy} & G_{zzzy} & 0 & G_{zzyx} \\ G_{yzxx} & G_{yzyy} & G_{yzzz} & 0 & G_{yzzx} & 0 & 0 & G_{yzxz} & 0 \\ 0 & 0 & 0 & G_{zxyz} & 0 & G_{zxxy} & G_{zxzy} & 0 & G_{zxyx} \\ G_{xyxx} & G_{xyyy} & G_{xyzz} & 0 & G_{xyzx} & 0 & 0 & G_{xyxz} & 0 \end{bmatrix}$$

$$\begin{aligned}
G_{xxyz} &= G_{dyz}^{(1)} + G_{dyz}^{(3)} + 2G_{gbx}^{(1)} + 2Q_{fax}^{(2)} - 4Q_{fbx}^{(1)} + Q_{px}^{(3)} + 2Q_{px}^{(4)} \\
G_{xxxy} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} - 2G_{dxy}^{(5)} + G_{gaz}^{(1)} - G_{gbz}^{(1)} - 2Q_{faz}^{(1)} - Q_{faz}^{(2)} + 2Q_{fbz}^{(1)} + Q_{fbz}^{(2)} + 2Q_{pz}^{(1)} + Q_{pz}^{(3)} \\
G_{xxzy} &= G_{dyz}^{(1)} + G_{dyz}^{(3)} + 2G_{gbx}^{(1)} - 2Q_{fax}^{(2)} - 4Q_{fbx}^{(1)} - Q_{px}^{(3)} - 2Q_{px}^{(4)} \\
G_{xxyx} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} + 2G_{dxy}^{(5)} + G_{gaz}^{(1)} - G_{gbz}^{(1)} - 2Q_{faz}^{(1)} + Q_{faz}^{(2)} + 2Q_{fbz}^{(1)} - Q_{fbz}^{(2)} + 2Q_{pz}^{(1)} - Q_{pz}^{(3)} \\
G_{yyyz} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} - 2G_{dyz}^{(5)} + G_{gax}^{(1)} - G_{gbx}^{(1)} - 2Q_{fax}^{(1)} - Q_{fax}^{(2)} + 2Q_{fbx}^{(1)} + Q_{fbx}^{(2)} + 2Q_{px}^{(1)} + Q_{px}^{(3)} \\
G_{yyxy} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} + 2G_{dxy}^{(5)} - G_{gaz}^{(1)} - G_{gbz}^{(1)} + 2Q_{faz}^{(1)} - Q_{faz}^{(2)} + 2Q_{fbz}^{(1)} - Q_{fbz}^{(2)} - 2Q_{pz}^{(1)} + Q_{pz}^{(3)} \\
G_{yyzy} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} + 2G_{dyz}^{(5)} - G_{gax}^{(1)} - G_{gbx}^{(1)} - 2Q_{fax}^{(1)} + Q_{fax}^{(2)} + 2Q_{fbx}^{(1)} - Q_{fbx}^{(2)} + 2Q_{px}^{(1)} - Q_{px}^{(3)} \\
G_{yyyx} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} - 2G_{dxy}^{(5)} - G_{gaz}^{(1)} - G_{gbz}^{(1)} + 2Q_{faz}^{(1)} + Q_{faz}^{(2)} + 2Q_{fbz}^{(1)} + Q_{fbz}^{(2)} - 2Q_{pz}^{(1)} - Q_{pz}^{(3)} \\
G_{zzyz} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} + 2G_{dyz}^{(5)} - G_{gax}^{(1)} - G_{gbx}^{(1)} + 2Q_{fax}^{(1)} - Q_{fax}^{(2)} + 2Q_{fbx}^{(1)} - Q_{fbx}^{(2)} - 2Q_{px}^{(1)} + Q_{px}^{(3)} \\
G_{zzxy} &= G_{dxy}^{(1)} + G_{dxy}^{(3)} + 2G_{gbz}^{(1)} + 2Q_{faz}^{(2)} - 4Q_{fbz}^{(1)} + Q_{pz}^{(3)} + 2Q_{pz}^{(4)} \\
G_{zzzy} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} - 2G_{dyz}^{(5)} - G_{gax}^{(1)} - G_{gbx}^{(1)} + 2Q_{fax}^{(1)} + Q_{fax}^{(2)} + 2Q_{fbx}^{(1)} + Q_{fbx}^{(2)} - 2Q_{px}^{(1)} - Q_{px}^{(3)} \\
G_{zzyx} &= G_{dxy}^{(1)} + G_{dxy}^{(3)} + 2G_{gbz}^{(1)} - 2Q_{faz}^{(2)} - 4Q_{fbz}^{(1)} - Q_{pz}^{(3)} - 2Q_{pz}^{(4)} \\
G_{yzxx} &= G_{dyz}^{(1)} - G_{dyz}^{(3)} + 2G_{gbx}^{(1)} + 4Q_{fbx}^{(1)} \\
G_{yzyy} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} - G_{dyz}^{(3)} + G_{gax}^{(1)} - G_{gbx}^{(1)} + 2Q_{fax}^{(1)} - 2Q_{fbx}^{(1)} - 2Q_{px}^{(1)} \\
G_{yzzz} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} - G_{dyz}^{(3)} - G_{gax}^{(1)} - G_{gbx}^{(1)} - 2Q_{fax}^{(1)} - 2Q_{fbx}^{(1)} + 2Q_{px}^{(1)} \\
G_{yzzx} &= G_{dxy}^{(2)} - G_{dxy}^{(5)} + 2G_{gbz}^{(1)} - 4Q_{faz}^{(1)} - Q_{faz}^{(2)} - Q_{fbz}^{(2)} - Q_{pz}^{(1)} + Q_{pz}^{(4)} \\
G_{yzxz} &= G_{dxy}^{(2)} + G_{dxy}^{(5)} + 2G_{gbz}^{(1)} - 4Q_{faz}^{(1)} + Q_{faz}^{(2)} + Q_{fbz}^{(2)} - Q_{pz}^{(1)} - Q_{pz}^{(4)} \\
G_{zxyz} &= G_{dxy}^{(2)} + G_{dxy}^{(5)} + 2G_{gbz}^{(1)} + 4Q_{faz}^{(1)} - Q_{faz}^{(2)} + Q_{fbz}^{(2)} + Q_{pz}^{(1)} + Q_{pz}^{(4)} \\
G_{zxxz} &= G_{dxy}^{(2)} - G_{dxy}^{(5)} + 2G_{gbz}^{(1)} - 4Q_{faz}^{(1)} - Q_{faz}^{(2)} - Q_{fbz}^{(2)} - Q_{pz}^{(1)} + Q_{pz}^{(4)} \\
G_{zxyx} &= G_{dxy}^{(2)} + G_{dxy}^{(5)} + 2G_{gbz}^{(1)} - 4Q_{faz}^{(1)} + Q_{faz}^{(2)} + Q_{fbz}^{(2)} - Q_{pz}^{(1)} - Q_{pz}^{(4)} \\
G_{xyxx} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} - G_{dxy}^{(3)} + G_{gaz}^{(1)} - G_{gbz}^{(1)} + 2Q_{faz}^{(1)} - 2Q_{fbz}^{(1)} - 2Q_{pz}^{(1)} \\
G_{xyyy} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} - G_{dxy}^{(3)} - G_{gaz}^{(1)} - G_{gbz}^{(1)} - 2Q_{faz}^{(1)} - 2Q_{fbz}^{(1)} + 2Q_{pz}^{(1)} \\
G_{xyzz} &= G_{dxy}^{(1)} - G_{dxy}^{(3)} + 2G_{gbz}^{(1)} + 4Q_{fbz}^{(1)} \\
G_{xyzx} &= G_{dyz}^{(2)} + G_{dyz}^{(5)} + 2G_{gbx}^{(1)} + 4Q_{fax}^{(1)} - Q_{fax}^{(2)} + Q_{fbx}^{(2)} + Q_{px}^{(1)} + Q_{px}^{(4)} \\
G_{xyxz} &= G_{dyz}^{(2)} - G_{dyz}^{(5)} + 2G_{gbx}^{(1)} + 4Q_{fax}^{(1)} + Q_{fax}^{(2)} - Q_{fbx}^{(2)} + Q_{px}^{(1)} - Q_{px}^{(4)}
\end{aligned}$$

* Rank 4 tensor (a).

$$\begin{bmatrix}
G_{yzxx} & G_{yzyy} & G_{yzzz} & 0 & G_{yzzx} & 0 & 0 & G_{yzxz} & 0 \\
0 & 0 & 0 & G_{zxyz} & 0 & G_{zxxz} & G_{zxxz} & 0 & G_{zxyx} \\
G_{xyxx} & G_{xyyy} & G_{xyzz} & 0 & G_{xyzx} & 0 & 0 & G_{xyxz} & 0
\end{bmatrix}$$

$$\begin{aligned}
G_{yzxx} &= 2Q_{fax}^{(3)} + Q_{px}^{(5)} + 2Q_{px}^{(6)} \\
G_{yzyy} &= -2G_{dyz}^{(6)} - Q_{fax}^{(3)} + Q_{fbx}^{(3)} + Q_{px}^{(5)} \\
G_{yzzz} &= 2G_{dyz}^{(6)} - Q_{fax}^{(3)} - Q_{fbx}^{(3)} + Q_{px}^{(5)} \\
G_{yzzx} &= 2G_{dxy}^{(4)} + G_{dxy}^{(6)} - Q_{faz}^{(3)} + Q_{fbz}^{(3)} - Q_{pz}^{(2)} + Q_{pz}^{(6)} \\
G_{yzxz} &= -2G_{dxy}^{(4)} + G_{dxy}^{(6)} - Q_{faz}^{(3)} + Q_{fbz}^{(3)} + Q_{pz}^{(2)} + Q_{pz}^{(6)} \\
G_{zxyz} &= 2G_{dxy}^{(4)} - G_{dxy}^{(6)} - Q_{faz}^{(3)} - Q_{fbz}^{(3)} + Q_{pz}^{(2)} + Q_{pz}^{(6)} \\
G_{zxyy} &= 2G_{dyz}^{(4)} + G_{dyz}^{(6)} - Q_{fax}^{(3)} + Q_{fbx}^{(3)} - Q_{px}^{(2)} + Q_{px}^{(6)} \\
G_{zxzy} &= -2G_{dxy}^{(4)} - G_{dxy}^{(6)} - Q_{faz}^{(3)} - Q_{fbz}^{(3)} - Q_{pz}^{(2)} + Q_{pz}^{(6)} \\
G_{zxyx} &= -2G_{dyz}^{(4)} + G_{dyz}^{(6)} - Q_{faz}^{(3)} + Q_{fbx}^{(3)} + Q_{px}^{(2)} + Q_{px}^{(6)} \\
G_{xyxx} &= -2G_{dxy}^{(6)} - Q_{faz}^{(3)} + Q_{fbz}^{(3)} + Q_{pz}^{(5)} \\
G_{xyyy} &= 2G_{dxy}^{(6)} - Q_{faz}^{(3)} - Q_{fbz}^{(3)} + Q_{pz}^{(5)} \\
G_{xyzz} &= 2Q_{faz}^{(3)} + Q_{pz}^{(5)} + 2Q_{pz}^{(6)} \\
G_{xyzx} &= 2G_{dyz}^{(4)} - G_{dyz}^{(6)} - Q_{faz}^{(3)} - Q_{fbx}^{(3)} + Q_{px}^{(2)} + Q_{px}^{(6)} \\
G_{xyxz} &= -2G_{dyz}^{(4)} - G_{dyz}^{(6)} - Q_{faz}^{(3)} - Q_{fbx}^{(3)} - Q_{px}^{(2)} + Q_{px}^{(6)}
\end{aligned}$$

* Rank 4 tensor (t).

$$\left[\begin{array}{ccc}
0 & G_{xxxy} & 0 \\
G_{yyyx} & 0 & G_{yyyz} \\
0 & G_{zzzy} & 0 \\
0 & G_{yyzy} & 0 \\
0 & G_{zzxy} & 0 \\
G_{xxyx} & 0 & G_{xxyz} \\
G_{yzzx} & 0 & G_{yzzz} \\
0 & G_{zxxz} & 0 \\
0 & G_{xyyy} & 0 \\
-\frac{G_{yyuz}}{2} + \frac{G_{uyzu}}{2} + G_{zxxz} & 0 & \frac{G_{xxyx}}{2} - \frac{G_{xxxy}}{2} + G_{xyyy} - G_{yyyx} + G_{zzxy}
\end{array} \right]$$

$$\begin{aligned}
G_{xxyy} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} - 2G_{dxy}^{(5)} + G_{gaz}^{(1)} - G_{gbz}^{(1)} \\
G_{yyyx} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} - 2G_{dxy}^{(5)} - G_{gaz}^{(1)} - G_{gbz}^{(1)} \\
G_{yyyz} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} - 2G_{dyz}^{(5)} + G_{gax}^{(1)} - G_{gbx}^{(1)} \\
G_{zzzy} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} - 2G_{dyz}^{(5)} - G_{gax}^{(1)} - G_{gbx}^{(1)} \\
G_{yyzy} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} + G_{dyz}^{(3)} + 2G_{dyz}^{(5)} + G_{gax}^{(1)} - G_{gbx}^{(1)} \\
G_{zzxy} &= G_{dxy}^{(1)} + G_{dxy}^{(3)} + 2G_{gbz}^{(1)} \\
G_{xxyz} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} + G_{dxy}^{(3)} + 2G_{dxy}^{(5)} + G_{gaz}^{(1)} - G_{gbz}^{(1)} \\
G_{xxyz} &= G_{dyz}^{(1)} + G_{dyz}^{(3)} + 2G_{gbx}^{(1)} \\
G_{yzzx} &= G_{dxy}^{(2)} - G_{dxy}^{(5)} + 2G_{gbz}^{(1)} \\
G_{yzzz} &= G_{dyz}^{(1)} + 2G_{dyz}^{(2)} - G_{dyz}^{(3)} - G_{gax}^{(1)} - G_{gbx}^{(1)} \\
G_{zxxz} &= G_{dyz}^{(2)} - G_{dyz}^{(5)} + 2G_{gbx}^{(1)} \\
G_{xyyy} &= G_{dxy}^{(1)} + 2G_{dxy}^{(2)} - G_{dxy}^{(3)} - G_{gaz}^{(1)} - G_{gbz}^{(1)}
\end{aligned}$$