

MPG No. 29.1.109 $m\bar{3}$ [Type I, cubic] [T tensor]

* Rank 0 tensor.

$$[T]$$

$$T = T_s^{(1)}$$

* Rank 1 tensor. * Rank 2 tensor (s).

$$\begin{bmatrix} T_{xx} & 0 & 0 \\ 0 & T_{xx} & 0 \\ 0 & 0 & T_{xx} \end{bmatrix}$$

$$T_{xx} = T_s^{(1)}$$

* Rank 2 tensor (a). * Rank 3 tensor (s). * Rank 3 tensor (a). * Rank 4 tensor (sss).

$$\begin{bmatrix} T_{xxxx} & T_{xxyy} & T_{xxyy} & 0 & 0 & 0 \\ T_{xxyy} & T_{xxxx} & T_{xxyy} & 0 & 0 & 0 \\ T_{xxyy} & T_{xxyy} & T_{xxxx} & 0 & 0 & 0 \\ 0 & 0 & 0 & T_{yzyz} & 0 & 0 \\ 0 & 0 & 0 & 0 & T_{yzyz} & 0 \\ 0 & 0 & 0 & 0 & 0 & T_{yzyz} \end{bmatrix}$$

$$T_{xxxx} = 2T_g^{(1)} + T_s^{(1)} + 2T_s^{(2)}$$

$$T_{xxyy} = -T_g^{(1)} + T_s^{(1)}$$

$$T_{yzyz} = -T_g^{(1)} + T_s^{(2)}$$

* Rank 4 tensor (ssa).

$$\begin{bmatrix} 0 & T_{xxyy} & -T_{xxyy} & 0 & 0 & 0 \\ -T_{xxyy} & 0 & T_{xxyy} & 0 & 0 & 0 \\ T_{xxyy} & -T_{xxyy} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$T_{xxyy} = 4M_{f3}^{(1)}$$

* Rank 4 tensor (aas).

$$\begin{bmatrix} T_{yzyz} & 0 & 0 \\ 0 & T_{yzyz} & 0 \\ 0 & 0 & T_{yzyz} \end{bmatrix}$$

$$T_{yzyz} = T_s^{(3)}$$

* Rank 4 tensor (aaa). * Rank 4 tensor (sa).

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ T_{yzyz} & 0 & 0 \\ 0 & T_{yzyz} & 0 \\ 0 & 0 & T_{yzyz} \end{bmatrix}$$

$$T_{yzyz} = M_{f3}^{(2)}$$

* Rank 4 tensor (as).

$$\begin{bmatrix} 0 & 0 & 0 & T_{yzyz} & 0 & 0 \\ 0 & 0 & 0 & 0 & T_{yzyz} & 0 \\ 0 & 0 & 0 & 0 & 0 & T_{yzyz} \end{bmatrix}$$

$$T_{yzyz} = M_{f3}^{(3)}$$

* Rank 4 tensor (s).

$$\begin{bmatrix} T_{xxxx} & T_{xxyy} & T_{xxxz} & 0 & 0 & 0 & 0 & 0 & 0 \\ T_{xxzz} & T_{xxxx} & T_{xxyy} & 0 & 0 & 0 & 0 & 0 & 0 \\ T_{xxyy} & T_{xxzz} & T_{xxxx} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & T_{yzyz} & 0 & 0 & T_{yzyy} & 0 & 0 \\ 0 & 0 & 0 & 0 & T_{yzyz} & 0 & 0 & T_{yzyy} & 0 \\ 0 & 0 & 0 & 0 & 0 & T_{yzyz} & 0 & 0 & T_{yzyy} \end{bmatrix}$$

$$T_{xxxx} = 2T_g^{(1)} + T_s^{(1)} + 2T_s^{(2)}$$

$$T_{xxyy} = 4M_{f3}^{(1)} - T_g^{(1)} + T_s^{(1)}$$

$$T_{xxzz} = -4M_{f3}^{(1)} - T_g^{(1)} + T_s^{(1)}$$

$$T_{yzyz} = M_{f3}^{(2)} - T_g^{(1)} + T_s^{(2)}$$

$$T_{yzyy} = -M_{f3}^{(2)} - T_g^{(1)} + T_s^{(2)}$$

* Rank 4 tensor (a).

$$\begin{bmatrix} 0 & 0 & 0 & T_{yzyz} & 0 & 0 & T_{yzyy} & 0 & 0 \\ 0 & 0 & 0 & 0 & T_{yzyz} & 0 & 0 & T_{yzyy} & 0 \\ 0 & 0 & 0 & 0 & 0 & T_{yzyz} & 0 & 0 & T_{yzyy} \end{bmatrix}$$

$$T_{yzyz} = M_{f3}^{(3)} + T_s^{(3)}$$

$$T_{yzyy} = M_{f3}^{(3)} - T_s^{(3)}$$

* Rank 4 tensor (t).

$$\begin{bmatrix} T_{xxxx} & 0 & 0 \\ 0 & T_{xxxx} & 0 \\ 0 & 0 & T_{xxxx} \\ 0 & 0 & T_{yyzz} \\ T_{yyzz} & 0 & 0 \\ 0 & T_{yyzz} & 0 \\ 0 & T_{yyzz} & 0 \\ 0 & 0 & T_{yyzz} \\ T_{yyzz} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$T_{xxxx} = 2T_g^{(1)} + 3T_s^{(1)}$$

$$T_{yyzz} = -T_g^{(1)} + T_s^{(1)}$$