

MPG No. 19.1.68 3m (3m1 setting) [Type I, trigonal] [M tensor]

* Rank 0 tensor. * Rank 1 tensor. * Rank 2 tensor (s). * Rank 2 tensor (a).

$$\begin{bmatrix} 0 & M_{xy} & 0 \\ -M_{xy} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{xy} = T_{pz}^{(1)}$$

* Rank 3 tensor (s).

$$\begin{bmatrix} M_{xxx} & 0 & 0 \\ -M_{xxx} & 0 & 0 \\ 0 & 0 & 0 \\ M_{yzz} & 0 & 0 \\ 0 & -M_{yzz} & 0 \\ 0 & -M_{xxx} & 0 \end{bmatrix}$$

$$M_{xxx} = M_{f2}^{(1)}$$

$$M_{yzz} = -3T_{du}^{(1)}$$

* Rank 3 tensor (a).

$$\begin{bmatrix} M_{yzz} & 0 & 0 \\ 0 & M_{yzz} & 0 \\ 0 & 0 & M_{xyz} \end{bmatrix}$$

$$M_{yzz} = -T_{du}^{(2)} + T_s^{(1)}$$

$$M_{xyz} = 2T_{du}^{(2)} + T_s^{(1)}$$

* Rank 4 tensor (sss).

$$\begin{bmatrix} 0 & 0 & 0 & 0 & M_{xxzx} & 0 \\ 0 & 0 & 0 & 0 & -M_{xxzx} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -M_{xxzx} \\ M_{xxzx} & -M_{xxzx} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -M_{xxzx} & 0 & 0 \end{bmatrix}$$

$$M_{xxzx} = M_{ga}^{(1)}$$

* Rank 4 tensor (ssa).

$$\begin{bmatrix} 0 & 0 & 0 & 0 & M_{xxzx} & M_{xxxy} \\ 0 & 0 & 0 & 0 & -M_{xxzx} & -M_{xxxy} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & M_{yzz} & M_{xxzx} \\ -M_{xxzx} & M_{xxzx} & 0 & -M_{yzz} & 0 & 0 \\ -M_{xxxy} & M_{xxxy} & 0 & -M_{xxzx} & 0 & 0 \end{bmatrix}$$

$$M_{xxzx} = -2T_{f1}^{(1)}$$

$$M_{xxxy} = -2T_{faz}^{(1)} + 2T_{pz}^{(1)}$$

$$M_{yzz} = -4T_{faz}^{(1)} - T_{pz}^{(1)}$$

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

$$\begin{bmatrix} 0 & M_{yzz} & 0 \\ -M_{yzz} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzzx} = -T_{pz}^{(2)}$$

* Rank 4 tensor (sa).

$$\begin{bmatrix} 0 & M_{xxzx} & M_{xxxz} \\ 0 & -M_{xxzx} & M_{xxxy} \\ 0 & 0 & M_{zzxy} \\ 0 & M_{yzzx} & 0 \\ M_{yzzx} & 0 & 0 \\ M_{xxzx} & 0 & 0 \end{bmatrix}$$

$$M_{xxzx} = T_{f1}^{(2)}$$

$$M_{xxxy} = -T_{faz}^{(2)} + T_{pz}^{(3)}$$

$$M_{zzxy} = 2T_{faz}^{(2)} + T_{pz}^{(3)} + 2T_{pz}^{(4)}$$

$$M_{yzzx} = -T_{faz}^{(2)} + T_{pz}^{(4)}$$

* Rank 4 tensor (as).

$$\begin{bmatrix} 0 & 0 & 0 & 0 & M_{yzzx} & M_{yzxy} \\ M_{yzxy} & -M_{yzxy} & 0 & M_{yzzx} & 0 & 0 \\ M_{xyxx} & M_{xyxx} & M_{xyzz} & 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzzx} = -T_{faz}^{(3)} + T_{pz}^{(6)}$$

$$M_{yzxy} = T_{f1}^{(3)}$$

$$M_{xyxx} = -T_{faz}^{(3)} + T_{pz}^{(5)}$$

$$M_{xyzz} = 2T_{faz}^{(3)} + T_{pz}^{(5)} + 2T_{pz}^{(6)}$$

* Rank 4 tensor (s).

$$\begin{bmatrix} 0 & 0 & 0 & 0 & M_{xxzx} & M_{xxxy} & 0 & M_{xxxz} & M_{xxyx} \\ 0 & 0 & 0 & 0 & -M_{xxzx} & -M_{xxxy} & 0 & -M_{xxxz} & -M_{xxxxy} \\ 0 & 0 & 0 & 0 & 0 & M_{zzxy} & 0 & 0 & -M_{zzxy} \\ 0 & 0 & 0 & 0 & M_{yzzx} & M_{yzyx} & 0 & M_{yzzx} & M_{yzxy} \\ -M_{yzxy} & M_{yzxy} & 0 & -M_{yzzx} & 0 & 0 & -M_{yzzx} & 0 & 0 \\ -\frac{M_{xxxy}}{2} - \frac{M_{xxyx}}{2} & \frac{M_{xxyx}}{2} + \frac{M_{xxxy}}{2} & 0 & -M_{xxxz} & 0 & 0 & -M_{xxzx} & 0 & 0 \end{bmatrix}$$

$$M_{xxzx} = M_{ga}^{(1)} - 2T_{f1}^{(1)} + T_{f1}^{(2)}$$

$$M_{xxxy} = -2T_{faz}^{(1)} - T_{faz}^{(2)} + 2T_{pz}^{(1)} + T_{pz}^{(3)}$$

$$M_{xxxz} = M_{ga}^{(1)} - 2T_{f1}^{(1)} - T_{f1}^{(2)}$$

$$M_{xxyx} = -2T_{faz}^{(1)} + T_{faz}^{(2)} + 2T_{pz}^{(1)} - T_{pz}^{(3)}$$

$$M_{zzxy} = 2T_{faz}^{(2)} + T_{pz}^{(3)} + 2T_{pz}^{(4)}$$

$$M_{yzzx} = -4T_{faz}^{(1)} - T_{faz}^{(2)} - T_{pz}^{(1)} + T_{pz}^{(4)}$$

$$M_{yzxy} = -M_{ga}^{(1)} - 2T_{f1}^{(1)}$$

$$M_{yzzx} = -4T_{faz}^{(1)} + T_{faz}^{(2)} - T_{pz}^{(1)} - T_{pz}^{(4)}$$

* Rank 4 tensor (a).

$$\begin{bmatrix} 0 & 0 & 0 & 0 & M_{yzzx} & M_{yzxy} & 0 & M_{yzzx} & M_{yzxy} \\ M_{yzxy} & -M_{yzxy} & 0 & M_{yzzx} & 0 & 0 & M_{yzzx} & 0 & 0 \\ M_{xyxx} & M_{xyxx} & M_{xyzz} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzzx} = -T_{faz}^{(3)} - T_{pz}^{(2)} + T_{pz}^{(6)}$$

$$M_{yzxy} = T_{f1}^{(3)}$$

$$M_{yzxz} = -T_{faz}^{(3)} + T_{pz}^{(2)} + T_{pz}^{(6)}$$

$$M_{xyxx} = -T_{faz}^{(3)} + T_{pz}^{(5)}$$

$$M_{xyzz} = 2T_{faz}^{(3)} + T_{pz}^{(5)} + 2T_{pz}^{(6)}$$

* Rank 4 tensor (t).

$$\begin{bmatrix} 0 & 0 & M_{xxxx} \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ -M_{xxxx} & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ M_{xxxx} & 0 & 0 \\ 0 & 0 & -M_{xxxx} \\ 0 & -M_{xxxx} & 0 \end{bmatrix}$$

$$M_{xxxx} = M_{ga}^{(1)}$$