

MPG No. 22.1.79 6 [Type I, hexagonal] [M tensor]

* Rank 0 tensor. * Rank 1 tensor.

$$[0 \ 0 \ M_z]$$

$$M_z = M_{pz}^{(1)}$$

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

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

$$M_{xxz} = -M_{faz}^{(1)} + M_{pz}^{(1)}$$

$$M_{zzz} = 2M_{faz}^{(1)} + M_{pz}^{(1)} + 2M_{pz}^{(2)}$$

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

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

* Rank 3 tensor (a).

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

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

$$M_{yzy} = M_{pz}^{(3)}$$

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

* Rank 4 tensor (sss).

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

$$M_{xxyz} = M_{gb}^{(1)}$$

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

* Rank 4 tensor (ssa).

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

$$M_{xxyz} = 2T_{f2}^{(1)}$$

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

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

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

$$M_{xxyz} = T_{f2}^{(2)}$$

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

* Rank 4 tensor (as).

$$\begin{bmatrix} M_{yzxx} & -M_{yzxx} & 0 & 0 & 0 & M_{yzyx} \\ M_{yzyx} & -M_{yzyx} & 0 & 0 & 0 & -M_{yzxx} \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzxx} = T_{f2}^{(3)}$$

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

* Rank 4 tensor (s).

$$\begin{bmatrix} 0 & 0 & 0 & M_{xxyz} & M_{xxzx} & 0 & M_{xxzy} & M_{xxxz} & 0 \\ 0 & 0 & 0 & -M_{xxyz} & -M_{xxzx} & 0 & -M_{xxzy} & -M_{xxxz} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ M_{yzxx} & -M_{yzxx} & 0 & 0 & 0 & M_{yzyx} & 0 & 0 & M_{yzyx} \\ -M_{yzyx} & M_{yzyx} & 0 & 0 & 0 & M_{yzxx} & 0 & 0 & M_{yzxx} \\ 0 & 0 & 0 & -M_{xxzx} & M_{xxzy} & 0 & -M_{xxzx} & M_{xxyz} & 0 \end{bmatrix}$$

$$M_{xxyz} = M_{gb}^{(1)} + 2T_{f2}^{(1)} + T_{f2}^{(2)}$$

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

$$M_{xxzy} = M_{gb}^{(1)} + 2T_{f2}^{(1)} - T_{f2}^{(2)}$$

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

$$M_{yzxx} = M_{gb}^{(1)} - 2T_{f2}^{(1)}$$

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

* Rank 4 tensor (a).

$$\begin{bmatrix} M_{yzxx} & -M_{yzxx} & 0 & 0 & 0 & M_{yzyx} & 0 & 0 & M_{yzyx} \\ M_{yzyx} & -M_{yzyx} & 0 & 0 & 0 & -M_{yzxx} & 0 & 0 & -M_{yzxx} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzxx} = T_{f2}^{(3)}$$

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

* Rank 4 tensor (t).

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

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

$$M_{yyyz}=-M^{(1)}_{gb}$$