MPG No. 18.3.67 32′ (32'1 setting) [Type III, trigonal] [M tensor]

* Rank 0 tensor. * Rank 1 tensor.

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

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

* 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).

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

$$M_{xxy} = M_{f1}^{(1)}$$
$$M_{xxz} = -M_{faz}^{(1)} + M_{pz}^{(1)}$$
$$M_{zzz} = 2M_{faz}^{(1)} + M_{pz}^{(1)} + 2M_{pz}^{(2)}$$
$$M_{yzy} = -M_{faz}^{(1)} + M_{pz}^{(2)}$$

* Rank 3 tensor (a).

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

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

* 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).

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

$$M_{xxzx} = -2T_{f1}^{(1)}$$
$$M_{xxxy} = -2T_{faz}^{(1)} + 2T_{pz}^{(1)}$$
$$M_{yzzx} = -4T_{faz}^{(1)} - T_{pz}^{(1)}$$

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

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

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

* Rank 4 tensor (sa).

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

$$M_{xxzx} = T_{f1}^{(2)}$$
$$M_{xxxy} = -T_{faz}^{(2)} + T_{pz}^{(3)}$$
$$M_{zzxy} = 2T_{faz}^{(2)} + T_{pz}^{(3)} + 2T_{pz}^{(4)}$$
$$M_{yzzx} = -T_{faz}^{(2)} + T_{pz}^{(4)}$$

* 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).

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

$$M_{xxzx} = M_{ga}^{(1)} - 2T_{f1}^{(1)} + T_{f1}^{(2)}$$
$$M_{xxxy} = -2T_{faz}^{(1)} - T_{faz}^{(2)} + 2T_{pz}^{(1)} + T_{pz}^{(3)}$$
$$M_{xxxz} = M_{ga}^{(1)} - 2T_{f1}^{(1)} - T_{f1}^{(2)}$$
$$M_{xxyx} = -2T_{faz}^{(1)} + T_{faz}^{(2)} + 2T_{pz}^{(1)} - T_{pz}^{(3)}$$
$$M_{zzxy} = 2T_{faz}^{(2)} + T_{pz}^{(3)} + 2T_{pz}^{(4)}$$
$$M_{yzzx} = -4T_{faz}^{(1)} - T_{faz}^{(2)} - T_{pz}^{(1)} + T_{pz}^{(4)}$$
$$M_{yzxy} = -M_{ga}^{(1)} - 2T_{f1}^{(1)}$$
$$M_{yzxz} = -4T_{faz}^{(1)} + T_{faz}^{(2)} - T_{pz}^{(1)} - T_{pz}^{(4)}$$

* Rank 4 tensor (a).

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

$$M_{yzzx} = -T^{(3)}_{faz} - T^{(2)}_{pz} + T^{(6)}_{pz}$$
$$M_{yzxy} = T^{(3)}_{f1}$$
$$M_{yzxz} = -T^{(3)}_{faz} + T^{(2)}_{pz} + T^{(6)}_{pz}$$
$$M_{xyxx} = -T^{(3)}_{faz} + T^{(5)}_{pz}$$
$$M_{xyzz} = 2T^{(3)}_{faz} + T^{(5)}_{pz} + 2T^{(6)}_{pz}$$

* Rank 4 tensor (t).

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

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