MPG No. 20.4.74 $\bar{3}'m'$ (-3'm'1 setting) [Type III, trigonal] [M tensor]

* Rank 0 tensor.

$$[M]$$

$$M = M_s^{(1)}$$

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

$$\begin{bmatrix} M_{xx} & 0 & 0 \\ 0 & M_{xx} & 0 \\ 0 & 0 & M_{zz} \end{bmatrix}$$

$$M_{xx} = -M_{du}^{(1)} + M_s^{(1)}$$
$$M_{zz} = 2M_{du}^{(1)} + M_s^{(1)}$$

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

$$\begin{bmatrix} M_{xxxx} & M_{xxyy} & M_{xxzz} & M_{xxyz} & 0 & 0 \\ M_{xxyy} & M_{xxxx} & M_{xxzz} & -M_{xxyz} & 0 & 0 \\ M_{xxzz} & M_{xxzz} & M_{zzzz} & 0 & 0 & 0 \\ M_{xxyz} & -M_{xxyz} & 0 & M_{yzyz} & 0 & 0 \\ 0 & 0 & 0 & 0 & M_{yzyz} & M_{xxyz} \\ 0 & 0 & 0 & 0 & M_{xxyz} & \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} \end{bmatrix}$$

$$M_{xxxx} = -2M_{du}^{(1)} - 4M_{du}^{(2)} + 3M_{g0}^{(1)} + M_s^{(1)} + 2M_s^{(2)}$$
$$M_{xxyy} = -2M_{du}^{(1)} + M_{g0}^{(1)} + M_s^{(1)}$$
$$M_{xxzz} = M_{du}^{(1)} - 4M_{g0}^{(1)} + M_s^{(1)}$$
$$M_{xxyz} = M_{gb}^{(1)}$$
$$M_{zzzz} = 4M_{du}^{(1)} + 8M_{du}^{(2)} + 8M_{g0}^{(1)} + M_s^{(1)} + 2M_s^{(2)}$$
$$M_{yzyz} = M_{du}^{(2)} - 4M_{g0}^{(1)} + M_s^{(2)}$$

* Rank 4 tensor (ssa).

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

$$M_{xxzz} = 3M_{du}^{(3)}$$
$$M_{xxyz} = 2T_{f2}^{(1)}$$

* Rank 4 tensor (aas).

$$\begin{bmatrix} M_{yzyz} & 0 & 0 \\ 0 & M_{yzyz} & 0 \\ 0 & 0 & M_{xyxy} \end{bmatrix}$$

$$M_{yzyz} = -2M_{du}^{(4)} + M_s^{(3)}$$
$$M_{xyxy} = 4M_{du}^{(4)} + M_s^{(3)}$$

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

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

$$M_{xxyz} = T_{f2}^{(2)}$$
$$M_{yzyz} = -3M_{du}^{(5)}$$

* Rank 4 tensor (as).

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

$$M_{yzxx} = T_{f2}^{(3)}$$
$$M_{yzyz} = -3M_{du}^{(6)}$$

* Rank 4 tensor (s).

$$\begin{bmatrix} M_{xxxx} & M_{xxyy} & M_{xxzz} & M_{xxyz} & 0 & 0 & M_{xxzy} & 0 & 0 \\ M_{xxyy} & M_{xxxx} & M_{xxzz} & -M_{xxyz} & 0 & 0 & -M_{xxzy} & 0 & 0 \\ M_{zzxx} & M_{zzxx} & M_{zzzz} & 0 & 0 & 0 & 0 & 0 & 0 \\ M_{yzxx} & -M_{yzxx} & 0 & M_{yzyz} & 0 & 0 & M_{yzzy} & 0 & 0 \\ 0 & 0 & 0 & 0 & M_{yzzy} & M_{yzxx} & 0 & M_{yzyz} & M_{yzxx} \\ 0 & 0 & 0 & 0 & M_{xxzy} & \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} & 0 & M_{xxyz} & \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} \end{bmatrix}$$

$$M_{xxxx} = -2M_{du}^{(1)} - 4M_{du}^{(2)} + 3M_{g0}^{(1)} + M_{s}^{(1)} + 2M_{s}^{(2)}$$
$$M_{xxyy} = -2M_{du}^{(1)} + M_{g0}^{(1)} + M_{s}^{(1)}$$
$$M_{xxzz} = M_{du}^{(1)} + 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_{s}^{(1)}$$
$$M_{xxyz} = M_{gb}^{(1)} + 2T_{f2}^{(1)} + T_{f2}^{(2)}$$
$$M_{xxzy} = M_{gb}^{(1)} + 2T_{f2}^{(1)} - T_{f2}^{(2)}$$
$$M_{zzxx} = M_{du}^{(1)} - 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_{s}^{(1)}$$
$$M_{zzzz} = 4M_{du}^{(1)} + 8M_{du}^{(2)} + 8M_{g0}^{(1)} + M_{s}^{(1)} + 2M_{s}^{(2)}$$
$$M_{yzxx} = M_{gb}^{(1)} - 2T_{f2}^{(1)}$$
$$M_{yzyz} = M_{du}^{(2)} - 3M_{du}^{(5)} - 4M_{g0}^{(1)} + M_{s}^{(2)}$$
$$M_{yzzy} = M_{du}^{(2)} + 3M_{du}^{(5)} - 4M_{g0}^{(1)} + M_{s}^{(2)}$$

* Rank 4 tensor (a).

$$\begin{bmatrix} M_{yzxx} & -M_{yzxx} & 0 & M_{yzyz} & 0 & 0 & M_{yzzy} & 0 & 0 \\ 0 & 0 & 0 & 0 & -M_{yzzy} & -M_{yzxx} & 0 & -M_{yzyz} & -M_{yzxx} \\ 0 & 0 & 0 & 0 & 0 & M_{xyxy} & 0 & 0 & -M_{xyxy} \end{bmatrix}$$

$$M_{yzxx} = T_{f2}^{(3)}$$
$$M_{yzyz} = -2M_{du}^{(4)} - 3M_{du}^{(6)} + M_{s}^{(3)}$$
$$M_{yzzy} = 2M_{du}^{(4)} - 3M_{du}^{(6)} - M_{s}^{(3)}$$
$$M_{xyxy} = 4M_{du}^{(4)} + M_{s}^{(3)}$$

* Rank 4 tensor (t).

$$\begin{bmatrix} M_{xxxx} & 0 & 0 \\ 0 & M_{xxxx} & M_{yyyz} \\ 0 & 0 & M_{zzzz} \\ 0 & M_{yyyz} & M_{yyzz} \\ M_{zzxx} & 0 & 0 \\ 0 & M_{xxyy} & -M_{yyyz} \\ 0 & M_{yzzy} & 0 \\ 0 & -M_{yyyz} & -\frac{M_{xxxx}}{2} + \frac{3M_{xxyy}}{2} + M_{yyzz} - M_{yzzy} + M_{zzxx} \\ \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} & 0 & 0 \\ -M_{yyyz} & 0 & 0 \end{bmatrix}$$

$$M_{xxxx} = -2M_{du}^{(1)} - 4M_{du}^{(2)} + 3M_{g0}^{(1)} + 3M_{s}^{(1)}$$
$$M_{yyyz} = -M_{gb}^{(1)}$$
$$M_{zzzz} = 4M_{du}^{(1)} + 8M_{du}^{(2)} + 8M_{g0}^{(1)} + 3M_{s}^{(1)}$$
$$M_{yyzz} = M_{du}^{(1)} + 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_{s}^{(1)}$$
$$M_{zzxx} = M_{du}^{(1)} - 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_{s}^{(1)}$$
$$M_{xxyy} = -2M_{du}^{(1)} + M_{g0}^{(1)} + M_{s}^{(1)}$$
$$M_{yzzy} = M_{du}^{(2)} + 3M_{du}^{(5)} - 4M_{g0}^{(1)} + M_{s}^{(1)}$$