MPG No. 23.3.84 $6'/m$ [Type III, hexagonal] [M tensor]

* Rank 0 tensor. * Rank 1 tensor. * Rank 2 tensor (s). * Rank 2 tensor (a). * Rank 3 tensor (s). * Rank 3 tensor (a). * 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).

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

$$M_{yzxx} = T_{f2}^{(3)}$$
$$M_{yzxy} = T_{f1}^{(3)}$$

* Rank 4 tensor (s).

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

$$
\begin{aligned}
M_{xxyz} &= M_{gb}^{(1)} + 2T_{f2}^{(1)} + T_{f2}^{(2)} \\
M_{xxzx} &= M_{ga}^{(1)} - 2T_{f1}^{(1)} + T_{f1}^{(2)} \\
M_{xxzy} &= M_{gb}^{(1)} + 2T_{f2}^{(1)} - T_{f2}^{(2)} \\
M_{xxxz} &= M_{ga}^{(1)} - 2T_{f1}^{(1)} - T_{f1}^{(2)} \\
M_{yzxx} &= M_{gb}^{(1)} - 2T_{f2}^{(1)} \\
M_{yzxy} &= -M_{ga}^{(1)} - 2T_{f1}^{(1)}
\end{aligned}
$$

* Rank 4 tensor (a).

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

$$
\begin{aligned}
M_{yzxx} &= T_{f2}^{(3)} \\
M_{yzxy} &= T_{f1}^{(3)}
\end{aligned}
$$

* Rank 4 tensor (t).

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

$$
\begin{aligned}
M_{xxxz} &= M_{ga}^{(1)} \\
M_{yyyz} &= -M_{gb}^{(1)}
\end{aligned}
$$