$$\begin{pmatrix} \mathbf{1} \\ \hline \mathbf{2} \\ \hline \mathbf{3} \end{pmatrix}.$$

Both sides of relation (1.1.4.8) remain unchanged if the indices $i$ and $j$ are interchanged, on account of the symmetry of the stress tensor. This shows that

$$e_{ijk} = e_{jik}.$$

Submatrices **2** and **3** are equal. One introduces here a two-index notation through the relation $e_{\alpha k} = e_{ijk}$, and the $e_{\alpha k}$ matrix can be written

$$\left(\frac{\mathbf{1}}{\mathbf{2}+\mathbf{3}}\right).$$

The relation between the full and the reduced matrix is therefore different for the $d_{ijk}$ and the $e_{kij}$ tensors. This is due to the particular property of the strain Voigt matrix (1.1.4.6), and as a consequence the relations between nonzero components of the reduced matrices are different for certain point groups (3, 32, 3$m$, $\bar{6}$, $\bar{6}2m$).

1.1.4.10.4. *Independent components of the matrix associated with a third-rank polar tensor according to the following point groups*

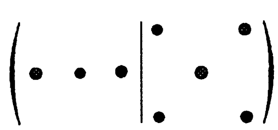
1.1.4.10.4.1. *Triclinic system*

(i) Group 1: all the components are independent. There are 18 components.

(ii) Group $\bar{1}$: all the components are equal to zero.

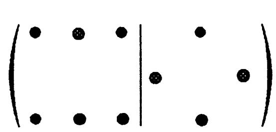
1.1.4.10.4.2. *Monoclinic system*

(i) Group 2: twofold axis parallel to $Ox_2$:



There are 8 independent components.

(ii) Group $m$:

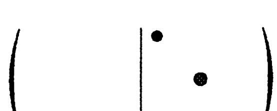


There are 10 independent components.

(iii) Group $2/m$: all the components are equal to zero.

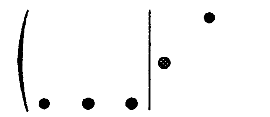
1.1.4.10.4.3. *Orthorhombic system*

(i) Group 222:



There are 3 independent components.

(ii) Group $mm2$:

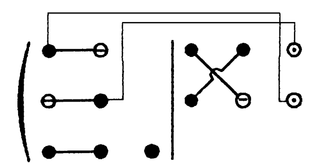


There are 5 independent components.

(iii) Group $mmm$: all the components are equal to zero.

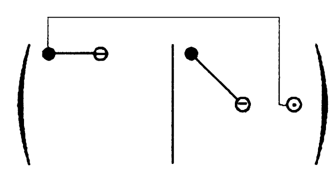
1.1.4.10.4.4. *Trigonal system*

(i) Group 3:



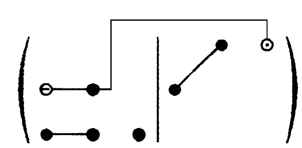
where the symbol ⊖ means that the corresponding component is equal to the opposite of that to which it is linked, ⊙ means that the component is equal to twice minus the value of the component to which it is linked for $d_{ijk}$ and to minus the value of the component to which it is linked for $e_{ijk}$. There are 6 independent components.

(ii) Group 32, twofold axis parallel to $Ox_1$:



with the same conventions. There are 4 independent components.

(iii) Group 3$m$, mirror perpendicular to $Ox_1$:

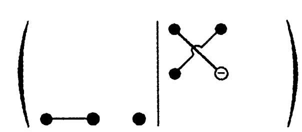


with the same conventions. There are 4 independent components.

(iv) Groups $\bar{3}$ and $\bar{3}m$: all the components are equal to zero.

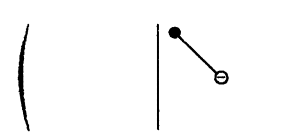
1.1.4.10.4.5. *Tetragonal, hexagonal and cylindrical systems*

(i) Groups 4, 6 and $A_\infty$:



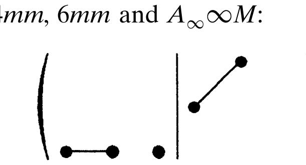
There are 4 independent components.

(ii) Groups 422, 622 and $A_\infty \infty A_2$:



There is 1 independent component.

(iii) Groups 4$mm$, 6$mm$ and $A_\infty \infty M$:



There are 3 independent components.





references