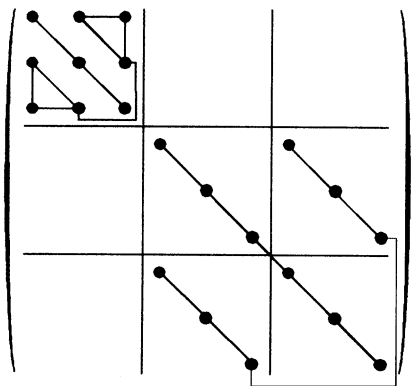1. TENSORIAL ASPECTS OF PHYSICAL PROPERTIES
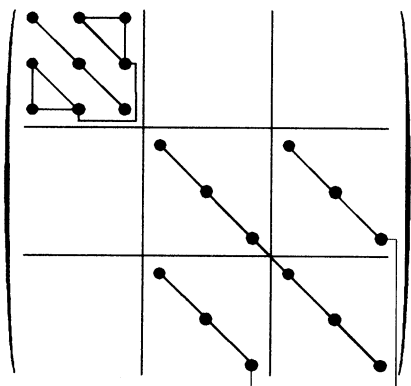
1.1.4.9.7.2. Groups $m\bar{3}m$, 432, $\bar{4}3m$

There are 4 independent components. The tensor is symmetric.

1.1.4.9.8. Spherical system

1.1.4.9.8.1. Groups $\infty(A_\infty/M)C$ and ∞A_∞
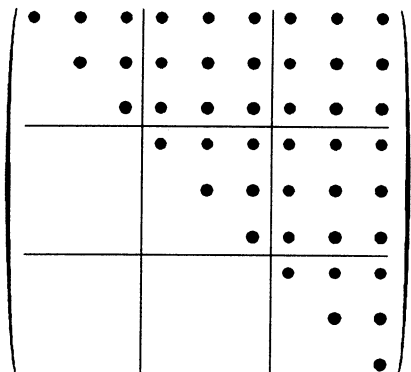

with

$$t_{1111} - t_{1122} = t_{1212} + t_{1221}.$$

There are 3 independent components. The tensor is symmetric.
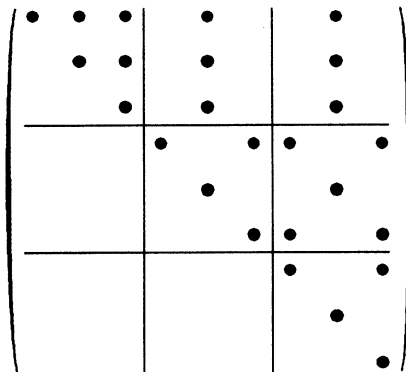
1.1.4.9.9. Symmetric tensors of rank 4

For symmetric tensors such as those representing principal properties, one finds the following, representing the nonzero components for the leading diagonal and for one half of the others.
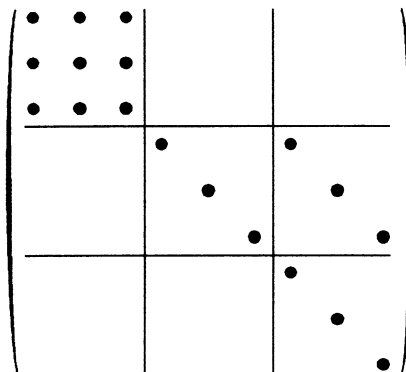
1.1.4.9.9.1. Triclinic system

There are 45 independent coefficients.

1.1.4.9.9.2. Monoclinic system

There are 25 independent coefficients.

1.1.4.9.9.3. Orthorhombic system

There are 15 independent coefficients.

1.1.4.9.9.4. Trigonal system

(i) Groups 3 and $\bar{3}$

kl \ ij	11	22	33	23	31	12	32	13	21
11	1111	1122	1133	1123	−2231	1112	1132	−2213	−1112
22		1111	1133	−1123	2231	−1121	−1132	2213	−1112
33			3333			3312			−3312
23				2323	2331	2213	2332		2213
31					3131	1132		2332	1132
12						1212	2231	1123	1221
32							3131	−2331	2231
13								2323	1123
21									1212

with

$$t_{1111} - t_{1122} = t_{1212} + t_{1221}.$$

There are 15 independent components.

references