$$|\alpha\rangle \cdot |JM\rangle = |\alpha\rangle \cdot \sum_{m,q} \langle jk; mq|JM\rangle \overbrace{|k,q\rangle}^{T_q^{(k)}} \otimes |jm\rangle$$

Normierungsbedingung: $\langle JM|JM\rangle = \sum_{mq} |\langle jk; mq|JM\rangle|^2 \overset{!}{=} 1$

$$T_q^{(k)} |\alpha; jm\rangle = \sum_{JM} |\alpha; JM\rangle \langle jk; mq|JM\rangle$$

$$\langle \alpha; jm| T_q^{(k)} |\alpha; jm\rangle = \langle jk; mq|jm\rangle \underbrace{\langle \alpha; jm|\alpha; jm\rangle}_{\text{reduziertes Matrixelement}}$$

Wigner-Eckert-Theorem

$$\boxed{\langle \alpha; jm| T_q^{(k)} |\alpha; jm\rangle = \langle jk; mq|jm\rangle \langle \alpha; j||T_k^{(q)}||\alpha; j\rangle}$$