Zeitschrift: Mémoires de la Société Fribourgeoise des Sciences Naturelles. Mathématique et physique = Mitteilungen der Naturforschenden Gesellschaft in Freiburg. Mathematik und Physik

Herausgeber: Société Fribourgeoise des Sciences Naturelles

Band: 4 (1921)

Artikel: Über die Prismenmethode zur Bestimmung der Brechungsindizes optisch zweiachsiger Kristalle ohne Absorptions- und Drehungsvermögen

Autor: Weber, Leonhard

Register: Formelvereichnis

DOI: https://doi.org/10.5169/seals-306876

Formelverzeichnis.

I (1)[1]

	x	y	z
ξ	α_1	α_2	α_3
η	β_1	β_2	β_3
ζ	γ_1	γ_2	γ_3

II (2)
$$\frac{\nu_1^2}{q^2-a^2}+\frac{\nu_2^2}{q^2-b^2}+\frac{\nu_3^2}{q^2-c^2}=0$$

III (3) (c-Kurve)
$$q^4-q^2(L_{11}\cos^2\psi+L_{22}\sin^2\psi+2L_{12}\sin\psi\cos\psi)+$$
$$+(M_{11}\cos^2\psi+M_{22}\sin^2\psi+2M_{12}\sin\psi\cos\psi)=0$$

IIIa (7)
$$f(q,\psi)\equiv[(M_{11}-M_{22})-(L_{11}-L_{22})q^2]\cos 2\psi+$$
$$2(M_{12}-L_{12}q^2)\sin 2\psi+[2q^4-(L_{11}+L_{22})q^2+(M_{11}+M_{22})]=0$$

IVa (3)
$$L_{ik}\equiv(b^2+c^2)\alpha_i\alpha_k+(c^2+a^2)\beta_i\beta_k+(a^2+b^2)\gamma_i\gamma_k$$
$$M_{ik}\equiv b^2c^2\alpha_i\alpha_k+c^2a^2\beta_i\beta_k+a^2b^2\gamma_i\gamma_k$$

IVb (5)
$$\alpha_i^2+\beta_i^2+\gamma_i^2=1 \qquad \alpha_i\alpha_k+\beta_i\beta_k+\gamma_i\gamma_k=0$$

V (5)
$$\alpha_1^2=\frac{a^4-L_{11}a^2+M_{11}}{(a^2-b^2)(a^2-c^2)} \qquad \alpha_2^2=\frac{a^4-L_{22}a^2+M_{22}}{(a^2-b^2)(a^2-c^2)} \qquad \alpha_1\alpha_2=\frac{-L_{12}a^2+M_{12}}{(a^2-b^2)(a^2-c^2)}$$
$$\beta_1^2=\frac{b^4-L_{11}b^2+M_{11}}{(b^2-c^2)(b^2-a^2)} \qquad \beta_2^2=\frac{b^4-L_{22}b^2+M_{22}}{(b^2-c^2)(b^2-a^2)} \qquad \beta_1\beta_2=\frac{-L_{12}b^2+M_{12}}{(b^2-c^2)(b^2-a^2)}$$
$$\gamma_1^2=\frac{c^4-L_{11}c^2+M_{11}}{(c^2-a^2)(c^2-b^2)} \qquad \gamma_2^2=\frac{c^4-L_{22}c^2+M_{22}}{(c^2-a^2)(c^2-b^2)} \qquad \gamma_1\gamma_2=\frac{-L_{12}c^2+M_{12}}{(c^2-a^2)(c^2-b^2)}$$

---

[1]) Die angeklammerten Zahlen geben die Seiten an.

VI (5)
$$u^4-(L_{11}+L_{22})\,u^3+(M_{11}+M_{22}+L_{11}L_{22}-L_{12}^2)\,u^2 \\ -(L_{11}M_{22}+L_{22}M_{11}-2L_{12}M_{12})\,u+(M_{11}M_{22}-M_{12}^2)=0$$

VII (44)
$$a_{11}x^2+a_{22}y^2+a_{33}z^2+2a_{12}xy+2a_{23}yz+2a_{31}zx=1$$

VIII (44)
$$a_{ik}\equiv a^2\alpha_i\alpha_k+b^2\beta_i\beta_k+c^2\gamma_i\gamma_k \qquad (a_{ik}=a_{ki})$$

IX (45)
$$q^4-q^2\left[(a_{22}+a_{33})\cos^2\psi+(a_{33}+a_{11})\sin^2\psi-2a_{12}\sin\psi\cos\psi\right] \\ +\left[(a_{22}a_{33}-a_{23}^2)\cos^2\psi+(a_{33}a_{11}-a_{31}^2)\sin^2\psi \right. \\ \left. -2(a_{12}a_{33}-a_{23}a_{31})\sin\psi\cos\psi\right]=0$$

X (45)
$$q^4-q^2(P_{11}\cos^2\psi+P_{22}\sin^2\psi-2P_{12}\sin\psi\cos\psi) \\ +(Q_{11}\cos^2\psi+Q_{22}\sin^2\psi-2Q_{12}\sin\psi\cos\psi)=0$$

$XIa^{(i)}$ (45)
$=1,2..6$
$$\begin{array}{ll} P_{11}\equiv a_{22}+a_{33} & Q_{11}\equiv a_{22}a_{33}-a_{23}^2 \\ P_{22}\equiv a_{33}+a_{11} & Q_{22}\equiv a_{33}a_{11}-a_{31}^2 \\ P_{12}\equiv a_{12} & Q_{12}\equiv a_{12}a_{33}-a_{23}a_{31} \end{array}$$

XI b (49)
$$\begin{aligned} a_{11}&\equiv q_1^2\sin^2\varepsilon+q_2^2\cos^2\varepsilon\equiv R_{11} \\ a_{13}&\equiv(q_1^2-q_2^2)\sin\varepsilon\cos\varepsilon\equiv R_{13} \\ a_{33}&\equiv q_1^2\cos^2\varepsilon+q_2^2\sin^2\varepsilon\equiv R_{33} \end{aligned}$$

XI c (51)
$$\begin{aligned} & a_{11}\cos^2\Gamma-2a_{12}\sin\Gamma\cos\Gamma+a_{22}\sin^2\Gamma \\ &\qquad \equiv q'^2_1\sin^2\varepsilon'+q'^2_2\cos^2\varepsilon'\equiv R'_{11} \\ & a_{31}\cos\Gamma-a_{23}\sin\Gamma \equiv-(q'^2_1-q'^2_2)\sin\varepsilon'\cos\varepsilon'\equiv R'_{13} \\ &\qquad a_{33}\equiv q'^2_1\cos^2\varepsilon'+q'^2_2\sin^2\varepsilon'\equiv R'_{33} \end{aligned}$$

XII (45)
$$a_{33}^4-(P_{11}+P_{22})\,a_{33}^3+(P_{11}P_{22}-P_{12}^2+Q_{11}+Q_{22})\,a_{33}^2 \\ -(P_{11}Q_{22}+P_{22}Q_{11}-2P_{12}Q_{12})\,a_{33}+(Q_{11}Q_{22}-Q_{12}^2)=0$$

XIII (51)
$$\begin{aligned} a_{11}u+a_{12}v+a_{13}w&=\lambda u \\ a_{12}u+a_{22}v+a_{23}w&=\lambda v \\ a_{13}u+a_{23}v+a_{33}w&=\lambda w \end{aligned}$$

XIV (51)
$$\begin{vmatrix} a_{11}-\lambda & a_{12} & a_{13} \\ a_{12} & a_{22}-\lambda & a_{23} \\ a_{13} & a_{23} & a_{33}-\lambda \end{vmatrix} = 0$$

XV (55)
$$\frac{a_{11}A + a_{12}B + a_{13}C}{A} = \frac{a_{12}A + a_{22}B + a_{23}C}{B} = \frac{a_{13}A + a_{23}B + a_{33}C}{C}$$

XVI (57)
$$\frac{a_{11}A_1 + a_{12}A_2 + a_{13}A_3}{A_1} = \frac{a_{12}A_1 + a_{22}A_2 + a_{23}A_3}{A_2} = \frac{a_{13}A_1 + a_{23}A_2 + a_{33}A_3}{A_3}$$
$$\frac{a_{11}B_1 + a_{12}B_2 + a_{13}B_3}{B_1} = \frac{a_{12}B_1 + a_{22}B_2 + a_{23}B_3}{B_2} = \frac{a_{13}B_1 + a_{23}B_2 + a_{33}B_3}{B_3}$$
$$\frac{a_{11}C_1 + a_{12}C_2 + a_{13}C_3}{C_1} = \frac{a_{12}C_1 + a_{22}C_2 + a_{23}C_3}{C_2} = \frac{a_{13}C_1 + a_{23}C_2 + a_{33}C_3}{C_3}$$