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# A Note on the Optical Properties of Strychnine

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With 1 figure in the text

Crystal-optical properties of strychnine  $C_{21}H_{22}N_2O_2$  have been reported by MAYRHOFER (1928), KOFER (1936) and WINCHELL (1954). These data include only the indices of refraction, for which, each author has given certain values. Data on the optical sign and the optical axial angle were not recorded, except for a merely qualitative expression given by WINCHELL (1954).

In what follows, the writers give the complete optical data they have measured on strychnine crystals grown on a glass carrier and also a discussion of the data given by previous authors.

Crystals of strychnine are colourless, elongated six sided, rarely about equant, with profile angles of  $125^\circ$ ,  $125^\circ$  and  $110^\circ$  (Fig. 1). Using the immersion method, the indices of refraction  $N_z$  and  $N_x$  have been found to be 1.720 and 1.621 respectively. By calculation  $N_y$  has been found to be 1.672 and  $N_z - N_x = 0.099$ .

Between crossed nicols, the crystals are anisotropic with parallel extinction and positive elongation.

The conoscopic image is monosymmetric. The quotient of the extreme retardations  $Q = 0.736$  while the quotient of the intermediate retardation and the maximum  $Q' = 1.2$ , from which the optic axial angle  $2V$  has been found to be  $-87^\circ$ . The Crystals are orthorhombic, lying on a prismatic face.

From a comparison of the above data with those recorded in the literature (Table 1), the following facts emerge.

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Fig. 1. Photomicrograph of strychnine crystals lying on a glass carrier. Crossed Nicols,  $42.5\times$ .

Table 1.

	MAYRHOFER (1928) <sup>3</sup>	KOFLER (1936) <sup>4</sup>	WINCHELL (1954) <sup>5</sup>	Present data
Nz	1.730	$\sim 1.740$	1.74	1.720
Ny	1.631	1.653	1.68	1.672
Nx	1.620	1.612	1.61	1.621
Nz—Nx	0.110	$\sim 0.128$	0.13	0.099
sign	+ ?	+ ?	+ ?	- ve
2V	very high	very high	very high	$87^\circ$

#### References

- MAYRHOFER, A. (1928): *Mikrochemie der Arzneimittel und Gifte*. Bd. 2. Berlin.  
 KOFLER, A. (1936): *Mikroskopische Methoden in der Mikrochemie*. Emil Haim & Co. Leipzig.  
 WINCHELL, A. N. (1954): *Optical properties of organic compounds*. 2nd Ed. Academic Press, New York.

Istituto di Vulcanologia dell'Università Catania, February 1960.

<sup>3</sup>) The data of MAYRHOFER do not include the optic axial angle, furthermore the optic sign is doubtful. From the indices of refraction as measured by him, it appears that the optic sign is positive, while a calculation of the optic axial angle based on these indices would give an angle of about  $+37^\circ$  which is surely not very highly!

<sup>4</sup>) The data of KOFLER lack an accurate determination of Nz. In addition the optic sign is doubtful and the optic axial angle undeterminable.

<sup>5</sup>) The data recorded as WINCHELL also remain without a determination of the optic sign and angle, although a calculation of 2V based on the given indices of refraction points to a high negative optic angle. However the indices Nz and Ny are overestimated while Nx is lower than the value recorded in the present investigation.