THE OPTICAL PROPERTIES OF ZINCITE FROM FRANKLIN, NEW JERSEY

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A specimen of especially pure zincite was recently obtained by this laboratory through the kindness of Mr. D. Jenkins, chief chemist of the New Jersey Zinc Company. The following analysis was made by Mr. L. H. Bauer, also of the New Jersey Zinc Company.

ZnO	= 99.63
MnO	= 0.27
FeO	= 0.01
SiO_2	= 0.08
	99.99

A study of the optical properties of the analyzed zincite was made on a prism cut with its edge parallel to the c-axis so that the indices of refraction, ω and ϵ, were measured at one setting. The source of light was a calibrated monochromatic illuminator. The following graph and table give the values obtained for the various wave lengths of light employed.

The "specific refractive energy"[1] constant of the oxides has been found to be very useful in this laboratory in the detection of errors, and in the approximation of the index of refraction and the density of minerals. It may be obtained, according to the law of Gladstone and Dale by the use of the formula

$$\frac{n-1}{d}=K$$

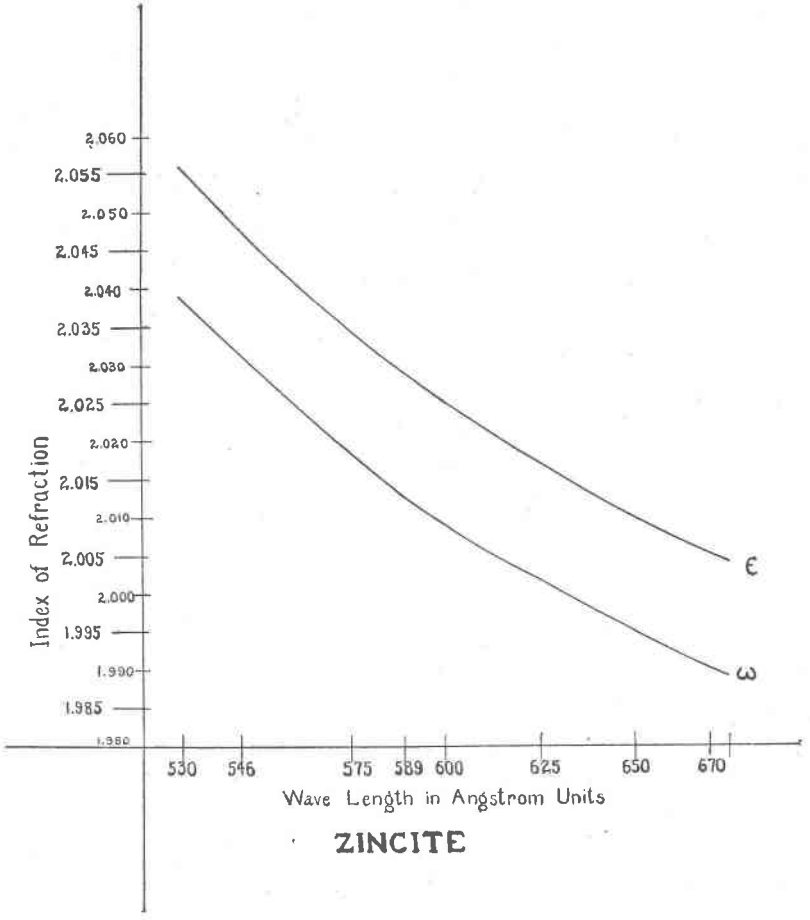
where

n = mean index of refraction.
d = density
K = specific refractive energy constant

E. S. Larsen[2] has determined the value of K for most of the oxides occurring in minerals so that the above formula may be effectively used in checking data.

[1] Gladstone and Dale; Refraction, Dispersion and Sensitiveness of Liquids. *Phil. Trans.*, Vol. 153, p. 317, 1863.

[2] Larsen, E. S.; Microscopic Determination of Nonopaque Minerals. *U. S. Geol. Surv. Bull.* 679, 1921.



The data in this paper, using sodium light (589Å units) gives $K = 1.80$ which is close to the value obtained by Larsen.

INDEX OF REFRACTION OF ZINCITE, FRANKLIN, N. J.

Wave length-A°	530	546 mercury green	575	589 sodium yellow	600	625	650	670 lithia red	675
Extraordinary ray ϵ	2.056	2.048	2.035	2.029	2.025	2.017	2.010	2.005	2.004
Ordinary ray-ω	2.039	2.032	2.019	2.013	2.009	2.002	1.995	1.990	1.989
Birefringence	.017	.016	.016	.016	.016	.015	.015	.015	.015