

Table 1. Application of empirical equation in the calculation of "K"

Compound	Form	Main absorption wavelengths (λ , microns)	"K"	Per cent difference from average
BeF ₂	qtz.	13.1	0.167	- 0.6
SiO ₂	qtz.	9.15	0.170	+ 1.2
GeO ₂	qtz.	11.5	0.169	+ 0.2
GeO ₂	rutile	14.0	0.166	- 1.2
Average			0.168	
BPO ₄	qtz.	8.92	0.141	-16.0
BAsO ₄	qtz.	10.45	0.151	-10.0
AlPO ₄	qtz.	8.9	0.172	+ 2.4
AlAsO ₃	qtz.	10.56	0.159	- 5.3
GaPO ₄	qtz.	9.55	0.197	+17.2
GaAsO ₄	qtz.	11.25	0.166	- 1.2
FePO ₄	qtz.	9.7	0.179	+ 6.5
GaSbO ₄	rutile	14.4	0.171	+ 1.8

For the ABO₄ compounds, arithmetical averages are used for the cation mass or atomic number components. A weighted average is used for the cation charge, calculated as

$$Z_{(A \cdot B)} = \frac{Z_A^2 + Z_B^2}{Z_A + Z_B}$$

Molar refractivities

In Table 2 there are presented molar refractivities (R_m) of a few AX₂ and ABX₄ compounds having mainly the silica and rutile structures. The values are calculated from data in standard reference works^{6,7,8}, and from data newly obtained in this laboratory. The main purpose here is to show the order of magnitude and trend of R_m in the different known forms of the compounds. Thus for SiO₂ the R_m values of the glass, low cristobalite and low tridymite are about 3.6 per cent above, and that of coesite, 1.8 per cent below the value for quartz. The total percentage difference is very close to that found

⁶ Data on Chemicals for Ceramic Use. Bulletin 118, National Research Council, Washington, D. C. (1949).

⁷ J. D. H. DONNAY and W. NOWACKI. Crystal Data. Geol. Soc. Am., Memoir 60 (1954).

⁸ Standard X-Ray Diffraction Powder Patterns. Circular 539, Nat. Bu. Standards, Washington, D. C., Vols. 1-7 (1953-1957).