substance: V_2O_5
property: dielectric constants

$\varepsilon(0)$	37.2	$E \parallel a$	dielectric function in the	76C
	20.1	$E \parallel b$	infrared: Fig. 1	
ε	4.28	$E \parallel b$, λ = 0.671 μm		76C
	4.41	0.589 μm		
	6.00	$E \parallel$, λ = 0.671 μm		
	6.50	0.589 μm		
	7.29	$E \parallel a$, λ = 0.671 μm		
$\varepsilon(\infty)$	4.28	$E \parallel a$	from refractive index	66K
	3.88	$E \parallel b$		
	4.49	$E \parallel c$		

The dielectric behaviour at lower frequencies is very anomalous. At very low frequencies relaxation phenomena are especially marked along the *c*-axis (Fig. 2, see also Fig. 3). This has been explained as relaxation of electron hopping about structural defects located in the <010> planes. For 100...200 K the activation energy is 0.045 eV and for T > 200 K 0.19 eV [74C].

References:

66K Kenay, N., Kannewurf, O. R., Whitmore, D. H.: J. Phys. Chem. Solids 27 (1966) 1237.
74C Chernenko, I. M., Ivon, A. I.: Fiz. Tverd. Tela 16 (1974) 2130.
76C Clauws, P., Vennik, J.: Phys. Status Solidi (b) 76 (1976) 707.
78I Ivon, A. T.: Izv. Vyss. Ucheb. Zaved. Fiz. 21 (1978) 130.
81I Ivon. A. T., Chernenko, M.: Fiz. Tekh. Poluprovodn. 15 (1981) 263.

Fig. 1.

V_2O_5. Real and imaginary parts of the dielectric constant vs. wavenumber for the three crystallographic directions [76C].

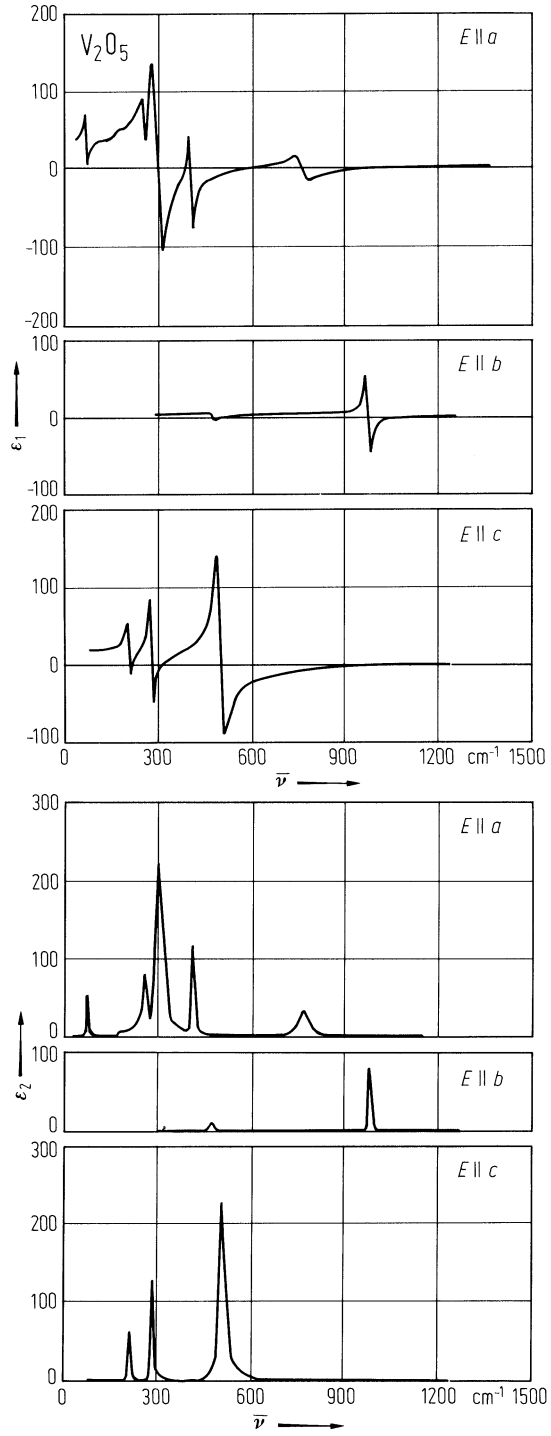

Fig. 2.

V_2O_5. Dielectric constant vs. temperature along the *c*-axis (*1*...*3*) and *b*-axis (*4*). Frequencies: I: 300 Hz, II:1000 Hz, III:10000 Hz [78I].

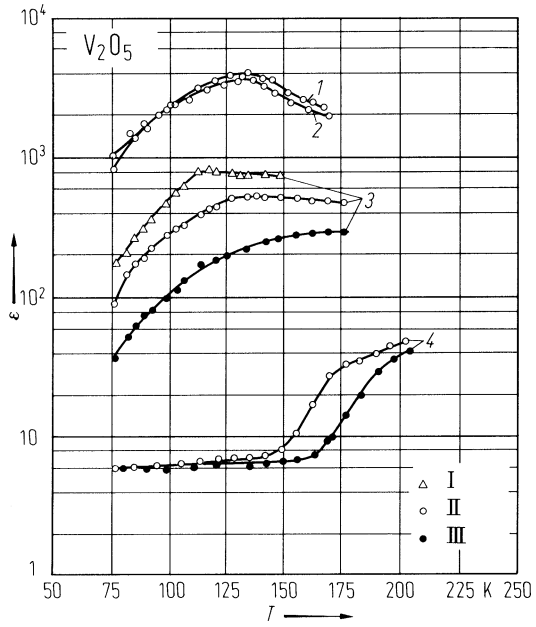

Fig. 3.

V_2O_5. (a) Dielectric constant and (b) conductivity vs. reciprocal temperature for single crystal along [0 0 1] axis at different frequencies: *1*: 10^3 Hz, *2*: $3 \cdot 10^3$ Hz, *3*: 10^4 Hz, *4*: $3 \cdot 10^4$ Hz, 5: dc value [81I].