

substance: VO₂
property: Seebeck coefficient

(in $\mu\text{V K}^{-1}$)

low-temperature phase

S	– 30...– 400	$T = 298 \text{ K}$	no measurable anisotropy in LT phase.	69B
	– 30...– 150	$T = 303 \text{ K, VO}_{1.994}$	S increases in magnitude with increasing activation energy;	75B
	– 880...–1000	$T = 303 \text{ K, VO}_{2.000}$		75B
	– 780...– 910	$T = 293 \text{ K}$	the low values are apparently associated with large concentrations of interband states which pin the Fermi level.	66K
	– 700...– 800	$T = 333 \text{ K}$		66K
	– 1000	$T = 295 \text{ K}$		65B

high-temperature phase

	– 23.1(2)	$\parallel c$		69B
	– 21.1(2)	$\perp c$		69B
	– 23	$T = 353 \text{ K}$	measurement on film	68H
	– 21	$T = 373 \text{ K}$		75B
	+ 30	$T = 430...480 \text{ K}$	no anisotropy in S measured	65B

There is a strong discontinuity in S at the transition temperature. Detailed behaviour in the semiconducting phase: Fig. 1. Effect of stoichiometry on S : Fig. 2. The fact that σ and $\exp(-eS/k)$ track parallel suggests an activationless mobility in the semiconducting phase. If an effective electron mass of $30 m_0$ is assumed, a drift mobility of $0.14 \text{ cm}^2/\text{V s}$ can be calculated from S [66K] for $T < T_{\text{tr}}$ in the range 293...333 K. For data on Nb-doped VO₂, see [75Z].

References:

- 65B Bongers, P. F.: Solid State Commun. 3 (1965) 275.
- 66K Kitahiro, I., Watanabe, A.: J. Phys. Soc. Jpn. 21 (1966) 2423.
- 68H Hensler, D. H.: J. Appl. Phys. 39 (1968) 2360.
- 69B Berglund, C. N., Guggenheim, H. J.: Phys. Rev. 185 (1969) 1022.
- 75B Brückner, W., Moldenhauer, W., Wich, H., Wolf, E., Oppermann, H., Gerlach, U., Reichelt, W.: Phys. Status Solidi (a) 29 (1975) 63.
- 75Z Zylberstejn, A., Mott, N. F.: Phys. Rev. B11 (1975) 4383.

Fig. 1.

VO₂. Thermoelectric power and conductivity vs. reciprocal temperature ($T < T_{tr}$) for a single-crystalline sample [66K]. (Sign of S is assumed to be negative.)

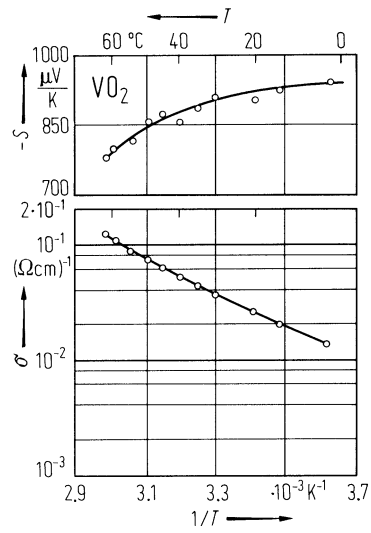


Fig. 2.

VO_{2-x} . Thermoelectric power vs. temperature for samples of different stoichiometry [75B]. Orientation S not specified.

