

substance: hematite (α -Fe₂O₃)

property: defects in pure Fe₂O₃

The most important extrinsic defect is an oxygen vacancy. From thermogravimetric and thermodynamic studies [61S] we have $[V_0] = 3.27 \cdot 10^{26} p_{O_2}^{-1/4} \exp(-2.03[\text{eV}]/kT)$ [cm⁻³]; p_{O_2} in atm, T in K. Reasonably rapid equilibrium with the surrounding atmosphere occurs for $T > 1000^\circ\text{C}$ [63G]. Single crystal studies are complicated by impurities and show very anomalous low-temperature effects unless crystals are annealed at 1300°C and quenched [64T].

References:

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- 63G Gardner, R. F. G., Swett, F., Tanner, D. W.: J. Phys. Chem. Solids 24 (1963) 1183.
- 64T Tanner, D. W., Swett, F., Gardner, R. F. G.: Br. J. Appl. Phys. 15 (1964) 1041.
- 83H Handbook of Chemistry and Physics, Weast, R. C., (ed.), 64th edition 1983, CRC Press, Inc.