

substance: WO₃
property: defects

For WO_{3-x} electron microscopy, density and XRD have established that for $x \leq 10^{-4}$ point defects, primarily oxygen vacancies, predominate, whereas for $x \geq 10^{-4}$ crystalline shear planes oriented in the {10m} directions of the ReO₃ phase are found. The oxygen deficit is accompanied by a marked colour change from yellow to green and finally to black. EPR data of slightly substoichiometric WO₃ after IR illumination showed a signal ascribed to W⁵⁺ [77G]. The change in resistivity with oxygen pressure at 750°C is shown in Fig. 1 and there is clear evidence for seven shear-like phases [77G].

References:

77G Grazzinelli, R., Schirmer, O. F.: J. Phys. C 10 (1977) L145.

Fig. 1.

WO_{3-x} . Resistivity vs. oxygen partial pressure at 750°C for both single crystal (left hand scale) and sintered discs. Values of x in the range 0...0.04 [77G]. Orientation for single crystals not specified.

