

ANOMALOUS BEHAVIOUR OF THE CRYSTAL LATTICE
OF HEMATITE IN THE HIGH TEMPERATURE REGION[⌘]

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The behaviour of the crystal lattice of hematite (Fe_2O_3) in the temperature range 20°C to 950°C was investigated using the method of x-ray powder diffraction. The radiation was $\text{CoK}\alpha$. The temperature dependence of the parameters a and c and the volume of the hexagonal unit cell was determined from the precise measurements of the Bragg angles (214) and (300) at 32 temperature points. The results show the following: (1) the parameters a and c and the volume of the unit cell change approximately in a linear way above $\approx 690^\circ\text{C}$, indicating that this temperature is the Néel temperature of the material; (2) the parameters a and c behave anomalously between 650°C and 690°C and the anomalous behaviour of the parameter c in this temperature range is more pronounced, which could be explained by the change of sign of the anisotropy in the basal plane at $\approx 650^\circ\text{C}$; (3) the anomalous change of the volume of the unit cell in the temperature range 650°C to 690°C is not very much pronounced which tells us that the methods which give the temperature change of this quantity, are not sufficiently precise for studying the behaviour of this material in the high temperature range. It is also found that within the accuracy of measurements there is no difference between the parameters of the unit cell before and after the heat treatment.

[⌘] This paper will be published elsewhere
in a detailed form.