

CRYSTAL AND MAGNETIC STRUCTURE OF DOUBLE TUNGSTATE $\text{KEr}(\text{WO}_4)_2$

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Results of structural and magnetic investigations of the potassium-erbium double tungstate, $\text{KEr}(\text{WO}_4)_2$, are presented. It crystallises in the monoclinic crystal structure, with the $C2/c$ space group. The unit cell contains four formula units and is described by parameters: $a = 10.615(2)\text{\AA}$, $b = 10.316(2)\text{\AA}$, $c = 7.534(2)\text{\AA}$, $\beta = 130.73(3)^\circ$. From the X-ray diffraction measurements, the fractional atomic coordinates, displacement parameters and interatomic distances have been determined. The specific heat $C(T)$ of the $\text{KEr}(\text{WO}_4)_2$ crystal has been measured over a temperature range 0.6 K–300 K. The susceptibility studies have been performed at $T = 0.25\text{ K} - 4.0\text{ K}$. The magnetic phase transition was observed at temperature of 0.48 K. The magnetization measurements have been carried out in the temperature region from 4.2 K to 60 K and in magnetic field up to 1.6 T. A strong anisotropy of magnetic properties was found.

The data on temperature and field dependences of magnetization have been used to calculate the exchange and dipole-dipole interactions energies and to determine the possible magnetic structure of $\text{KEr}(\text{WO}_4)_2$.

A good agreement between experimental data and theoretical results obtained in frames of the two-dimensional Ising model can be considered an evidence of existence in the studied compound of the low-dimensional character of magnetic ordering of ferromagnetic planes with magnetic moment along the c axis.