by x-ray structure analysis in the $NaCl:CdCl_2$ system [8], where they form the compound Na_6CdCl_8, which also has hexagonal syngony. The latter system, however, is not a crystal phosphor, and the question of the occurrence of a new type of luminescence center was, of course, not raised in [8]. A study of $NaCl:EuCl_2$ shows that a molecular type of center in inclusions of a complex activator compound can arise in crystal phosphors, and then electron microscopy can help identify it.

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TEMPERATURE DEPENDENCE OF THE PITCH OF THE MAGNETIC HELIX IN RARE-EARTH METALS

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Detailed neutron-diffraction investigations [1] have established that in the ordered antiferromagnetic phase the heavy rare-earth metals (Tb, Dy, Ho, Er, and Tu) are characterized by a noncollinear arrangements of the magnetic moments in space. In a sufficiently wide interval below the Neel temperature T_N, terbium, dysprosium, and holmium have a simple helical structure (HS). In these metals, which have a close-packed hexagonal lattice, the average magnetic moments along the c axis are "twisted" along a helix, and in a specified basal plane they are oriented to one side. The helical configuration of the magnetic moments can be described by a vector $\vec{k}_0$, the direction of which defines the axis of the helicoid, and the length determins its pitch. The angle ϕ_0 through which the magnetic moments are turned in neighboring basal planes is given by the relation $\phi_0 = ck_0/2$.

As indicated in [2], in a number of rare earth metals an important role may be played by the exchange magnetoelastic energy due to the strong dependence of the exchange interaction between the ions on the lattice parameter along the c axis. The aforementioned magnetoelastic effects were investigated in detail in [3], where it was possible, within the framework of a rather simple scheme, to reconcile the observed anomalous temperature dependence of the lattice parameter c(T) in the antiferromagnetic phase with the temperature variation of the helicoid $\phi_0(T)$ in dysprosium.

In [2, 3], the temperature dependence of the pitch of the magnetic helix was analyzed in terms of the long-range order parameter (magnetization) at $T < T_N$. It is undoubtedly of interest of observe magnetic neutron scattering in the region $T > T_N$, where the critical fluctuations of the long-range-order with a large spin-correlation radius are significant. Naturally, these fluctuations should have a helicoidal character and it is desirable to extend the investigation of the temperature dependence of the helicoid parameters to the

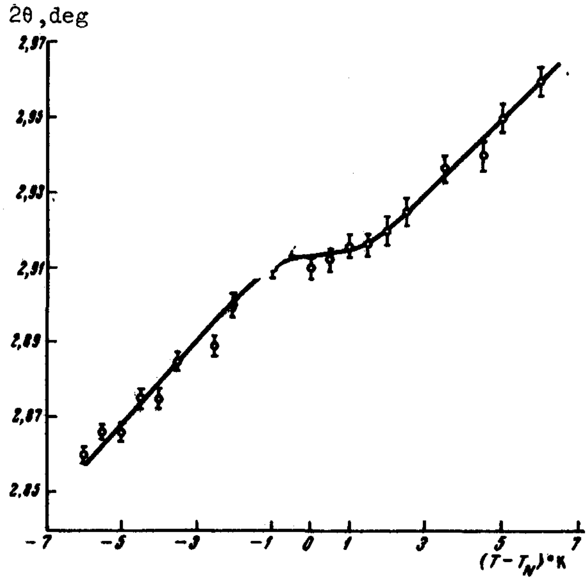

Fig. 1. Temperature dependence of the angular position of the "center of gravity"of the magnetic peak for Dy.

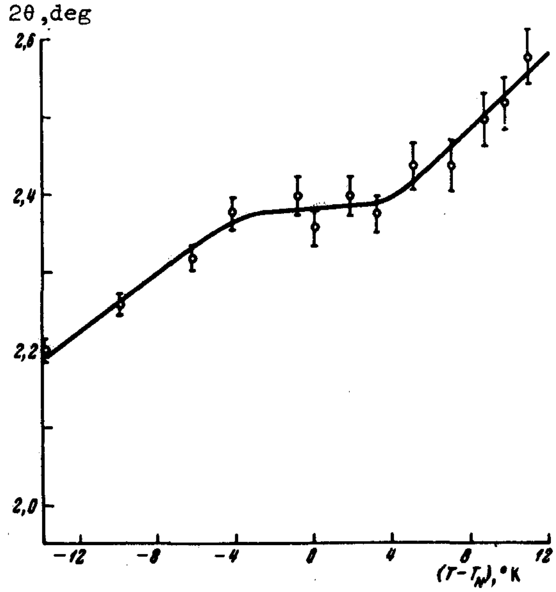

Fig. 2. Temperature dpeendence of the angular position of the "center of gravity" of the magnetic peak for Ho.

region $T > T_N$. We have observed scattering of a monochromatic beam of thermal neutrons by polycrystalline samples of dysprosium and holmium in the vicinity of the small-angle magnetic satellite (momentum transfer $\vec{q} - \vec{k}_0$) at $T \approx T_N$.

The measurements were made with the diffractometer of our institute. Samples in the form of thin plates were secured in a heating block placed in contact, through a special neck, with the cold volume of a cryostat. Heat was supplied by an electric heater and the temperature was maintained automatically accurate to ± 0.05°K near the boiling point of liquid nitrogen and accurate to ± 0.5°K at T = 190°K. Temperature regulation in the indicated region entails considerable difficulties and requires a special choice of the material and dimensions of the heating block.

The Neel temperature was determined from the kink on the plot of the temperature dependence of the maximum of the magnetic peak and from its strong narrowing near the phase transition. Figures 1 and 2 show the temperature dependence of the angular position of the "center of gravity of the magnetic peak for dysprosium and holmium at $T \approx T_N$, we call attention to the clear-cut "slowing down" of the growth of the helicoid angle in the immediate vicinity of T_N. In the region $T \geq T_N$ there is a distinctly observed scattering by fluctuation of long-range helical order, and the pitch of the helicoid maintains its strong temperature dependence.

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