

# Magnetic Resonance and Related Phenomena

Proceedings of the XIXth Congress Ampere  
Heidelberg, September 1976

Edited by

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Groupement Ampere, Heidelberg – Geneva 1976

THE EPR INVESTIGATION OF THE LATTICE DYNAMICS IN THE  $ABF_6 \cdot 6H_2O$  CRYSTALS IN THE PHASE TRANSITION REGION.

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The following phenomena, which occur in the  $ABF_6 \cdot 6H_2O$  crystals (the  $A(H_2O)_6^{2+}$  and  $BF_6^{2-}$  octahedra are packed as in CsCl structure;  $A = Zn^{2+}, Mn^{2+}, Ni^{2+}, Cu^{2+}$ ;  $B = Ge^{4+}, Zr^{4+}, Fe^{3+}$ ) and the fragments of their lattice when the temperature is changed, are considered: a) the changes of crystal lattice and its fragments in which their symmetry is conserved; b) the structure changes during phase transitions (P.T.), discovered in  $AGeF_6 \cdot 6H_2O$ ; c) the influence of the conditions of obtaining stationary state in crystal on the structural characteristics and properties of crystal; d) the dynamics of the distortions in the crystal with Jahn-Teller ion during P.T.

The detailed P.T. investigation enabled to gain information about P.T. region, its dependence on the admixture ion concentration and nature; the conditions of the appearance and the hysteresis character of P.T.; the symmetry of the crystal and magnetic centres above and below the P.T. temperature.

The energy inequivalence of Jahn-Teller distortions of  $Cu(H_2O)_6$  octahedra  $\Delta \approx 150cm^{-1}$ , occurring at P.T., is shown to correspond to the  $\Delta$  value, awaited for the crystal when there is uniaxial pressure of 3-4 kbar along  $\langle 100 \rangle$ .

The reasons for presence or absence of P.T. in the  $ABF_6 \cdot 6H_2O$  crystals and the possible types of their symmetry at room temperature are discussed.