05. PHYSICAL PROPERTIES AND STRUCTURE

05.2-29 GROWTH AND PROPERTIES OF PYROELECTRIC SINGLE CRYSTALS OF TETRAGONAL TUNGSTEN BROMIDE STRUCTURE TYPE. By V.A. Eravchenko, A.T. Bobolev, Institute of Radioengineering and Electronics, Academy of Sciences of the USSR, K.Marx av.10, Moscow, GSP-3, 103907, USSR.

Crystal-chemical stability analysis is made for tetragonal tungsten-bromide structure type \[ A^+_x B^+_y B^+_{2-x-y} X^-_{2-y} \] where A+x and A' are large cations in five- and four-sided channels of the structure, C are cations in three-sided channels, B and B' are multi-valent cations in two types of octahedra) in case when A are cations of alkaline and alkaline-earth metals.

Single crystals of some solid solutions of this type are grown. The stability field of ferroelectric crystals having this structure type is determined for (Ba,Sr,Ca)NbO₃ system. This field is shown to be much broader than for ceramic samples studied earlier (G.A. Smolensky, M. Gaffar and A. Abu EI-Fadl University, Assiut,Egypt.

Single crystals of some solid solutions of this type are studied. The effect of sample thickness and pressure contact on the electrical conductivity is also discussed. Some interesting features of the correlation between the valency and ionic radii of the dopant is presented.

05.2-28 ELECTRICAL CONDUCTIVITY AND DIELECTRIC CONSTANT OF PURE AND DOPED TRIGLYCINE SULPHATE SINGLE CRYSTALS. By M. Gaffar and A. Abu EI-Fadl Physics Department, Faculty of Science, Assiut University, Assiut, Egypt.

The dielectric constant and both the A.C. and D.C. electrical conductivity of pure and doped single crystals of TGS are investigated in the temperature range 300-4500K. The influence of Na, Cu, Co, Cr and Fe ions on the type of conduction, type of transition, transition temperature, Curie Weiss constants and the dielectric constant are studied. The effect of sample thickness and pressure contact on the electrical conductivity is also discussed. Some interesting features of the correlation between the valency and ionic radii of the dopant is presented.

05.2-30 RELATIONS BETWEEN THE STRUCTURE, MORPHOLOGY AND PHYSICAL PROPERTIES OF TRIGONAL AND MONOCLINIC TRL₃[BO₃]₄ CRYSTALS. L.I.Leonyuk and H.I.Leonyuk, Department of Geology, Moscow State University, Moscow, USSR.

Two structural types of TRL₃[BO₃]₄ crystals are known. The one, possessing a R3c space group (structural type of huntite) is more stable. It exists in the entire series of rare-earth-aluminium orthoborates. At temperatures exceeding 1270 K, Sr-Ru-Ru compounds are crystallized according to the 0 2/ c space group as well.

There is a direct relationship between the development of hkl faces and the experimentally observed total intensity of X-rays reflected from the corresponding atomic lattices (e.g. I010+I002+I003+...+I004). Faces {110}, {110} and {010} of monoclinic crystals correspond to two trigonal prisms (1120) and (0110) in huntite-structured crystals. The base-pinnacle (001) conforms to that having the same index in the trigonal crystal. The huntite rhombohedron (0101) of the monoclinic crystal is represented by a rhombic prism (111) and pinnacle (002). The violation of significance of the faces in monoclinic crystals as compared with the trigonal ones is due to the peculiarity of their internal structure. TRL₃[BO₃]₄ crystals possess piezoelectric and nonlinear-optical properties. These properties vanish in the phase transition into the monoclinic modification.