**PS16.03.11 REGENERATION GROWTH OF SOME HEXAGONAL (TRIGONAL) CRYSTALS UNDER HYDROTHERMAL CONDITIONS.** L.N. Demianets Institute of Crystallography, RAS, Moscow, Russia

The specific features of the regeneration growth (RG) of nepheline $Na_3KAl_3Si_3O_{12}$, beril $Be_3Al_2Si_3O_{12}$, ruby $Al_2O_3$:Cr, $GaPO_4$ were studied. The preferable directions of RG were found on the base of kinetic and crystallographic data. The equilibrium and non-equilibrimn growth forms were established for the crystals mentioned above. The morphologies of the singular and regeneration planes were investigated.

For these crystals very low normal growth rates are typical and we need to search for the new ways to grow large high-quality single crystals. One of the way is to use the RG when regeneration planes are used as seeds. The regeneration planes are known to be absent in the crystal endhabit built up by the flat F-faces.

For nepheline the planes {10.1} and {11.0} are found to be the regeneration planes while the monohedra (00.1), (00.1) and prism {10.0} are the faces of equilibrium growth form which are present in the final habit of crystals. Multi-head growth surface is characteristic for the faces of pyramid {10.1} and prism {11.0}.

In the case of beril the equilibrium form consists of the pinacoid (00.1), pyramids {11.2}, {10.2} and prism {11.0}. The RG directions are perpendicular to {11.1} or {11.4} planes. Multy-head growth is typical for these planes. The regeneration planes are perpendicular to {10.0}.

For ruby, the faces {11.3}, {00.1} and {10.0} represent the equilibrium habit of crystal. RG occurs in the directions perpendicular to {10.5}, {10.3}, {10.10} directions.Thin striations parallel to {00.1} is typical of {10.0} faces.

All the crystals demonstrate the best quality if the regeneration plane is perpendicular to one of the equilibrium form which is growing due to spiral-layer mechanism.

**PS16.03.12 WORLD WIDE WEB ACCESS TO THE BIOLOGICAL CRYSTALLIZATION DATABASE.** Gary L. Gilliland, Michael Tung, Jane E. Ladner, The Center for Advanced Research in Biotechnology of the University of Maryland Biotechnology Institute and National Institute of Standards and Technology, 9600 Gudelsky Dr., Rockville, MD 20850, USA

The NIST/NASA/CARB Biological Macromolecule Crystallization Database (BMCD) is now available on the World Wide Web (http://ibm4.carb.nist.gov:4400/bmcd/bmcd.html). The database entries include data abstracted from published crystallographic reports. Each entry consists of information describing the biological macromolecule crystallized, crystal parameters, crystallization conditions for each crystal form and literature references. This is the first crystallographic database available with full search capabilities over the internet. The BMCD serves as the NASA Protein Crystal Growth Archive in that it contains protocols and results of crystallization experiments undertaken in microgravity (space). For the microgravity experiments, the database records the results, whether successful or not, from NASA-sponsored protein crystal growth experiments in microgravity and from microgravity crystallization studies sponsored by other international organizations. The BMCD was designed as a tool to assist X-ray crystallographers in the development of protocols to crystallize biological macromolecules, those that have previously been crystallized, and those that have not been crystallized.

**PS16.03.13 ELECTROCHEMICAL CRYSTAL GROWTH AND CHARACTERIZATION OF THE IONIC CONDUCTOR $K_{1-x}Ba_xBiO_3$.** P. D. Han[1], S. R. Wilson[2], Y. G. Gao[3], A. H.-J. Wang[3], D. A. Payne[1], [1]Department of Materials Science and Engineering, Seitz Materials Research Laboratory, and Science and Technology Center for Superconductivity, [2]Department of Chemistry, Materials Chemistry Laboratory, [3]Department of Cell and Structural biology, University of Illinois at Urbana-Champaign, IL 61801 USA

$K_{1-x}Ba_xBiO_3$ (x=0.05) single crystals up to 3x3x3mm$^3$ in size were grown by a low-temperature electrochemical method from a KOH flux at 255°C. Data are reported for the morphology of the as-grown crystals as observed by optical and electron microscopy. Single crystal x-ray diffraction measurements were carried out on a Siemens CCD instrument. Electrical conductivity data were obtained from 5°K to 750°K, and thermogravimetric analysis was carried out on a TA 2950 instrument.

Information are reported for crystal growth parameters, single-crystal structure, electrical conductivity characteristics and thermogravimetry of single crystal $K_{1-x}Ba_xBiO_3$. The partial occupancy of potassium sites is consistent with ionic conductivity for the tunnel structure. The influence of Ba-doping on ionic conductivity is also discussed.

**PS16.03.14 GROWTH OF $\alpha$-$Al_2O_3$ BICRYSTAL BY BRIDGMAN METHOD.** E. K. Kov'ev, B. M. Allaudinov, Crystallography Institute Russian Academy of Science, M. Yu. Kupriyanov, S. N. Polyakov, Institute of Nuclear Physics Moscow State University.

The development of modern cryoelectronics based on HTS Josephson junctions demands the fabrication of high quality $\alpha$-$Al_2O_3$ bicrystal substrates. Unfortunately the solid-phase intergrowing method usually used for its fabrication gives a large density of active aluminum atoms in the vicinity of the boundary. This results in degradation of the basic parameters of the HTS Josephson junction made on $\alpha$-$Al_2O_3$ bicrystal substrates. The alternative is to use naturally grown bicrystal for the substrates fabrication. In this paper we reported the main result in the development of the new technology for growth the $\alpha$-$Al_2O_3$ bicrystals by horizontal Bridgman method using universal apparatus "Sapphire-2". The crystals with typical size 150x90x20mm and average velocity of the crystallization 10mm/h were grown in a specially design Mo bath by two-seeds method.

The crystallization fronts during growth process are coincide with [112-0] directions. The inclination angles 2θ of the symmetrical boundary are closed to 24°, 28°, 36°. The R and M-planes is used as a bicrystal surfaces. The special manipulator has been developed for control the orientation of the parts of the seed bicrystal with the accuracy better that 0.3° in all three crystallographycal directions. The quality of the bicrystals was investigated by X-ray diffraction, optical and electron microscopy methods. It was found by X-ray diffractometry that the missorientaton angles in three crystallographic directions has the accuracy 0.5°. The full width at half maximum of the rocking curve (101-2), (101-0) and (1202) reflections near the boundary closed to 20-30 arc. sec. The structure of the dislocations and microcracks formation in the vicinity of the bicrystal boundaries are investigated.