Etude Cristallochimique Comparee et Conductivite Ionique des Deux Varietes $Li_2Te_2O_5$ *α et β*. D. CACHAU-HERREILLAT, A. NORBERT, M. MAURIN, AND E. PHILIPPOT,* Laboratoire de Chimie Minerale C, ERA 314, Chimie des Materiaux, Universite des Sciences et Techniques du Languedoc, Place Eugene Bataillon, 34060 Montpellier Cedex, France. $Li_2Te_2O_5$ α is monoclinic, space group $P2_1/n$ with $a = 10.355(3)$, $b = 4.702(1)$, $c = 10.860(3)$ Å, $\beta = 110.13(1)°$, and $Z = 4$. $Li_2Te_2O_5\beta$ is orthorhombic, space group $Pnaa$ with $a = 5.194(1)$, $b = 8.170(2)$, $c = 24.165(5)$ Å, and $Z = 8$. The structure refinements were performed to final R values of 0.026 and 0.039 for $Li_2Te_2O_5$ α and β, respectively. The bidimensional network of these two crystal structures is characterized by sheets of Te_6O_6 cycles for $Li_2Te_2O_5$ α and $Te_{10}O_{12}$ cycles for $Li_2Te_2O_5\beta$. The difference between these two crystal structures is based upon the distribution of the terminal Te–O bonds of Te_2O_5 groups of the Li^+ cations and of the lone pairs, E, of tellurium IV atoms. The results of electric conductivity measurements on homogenous ceramic disks are reported.

Etude du Comportement du Niobium IV et du Titane III dans Quelques Oxydes A Structure en Cages du Type $A_3M_8O_{21}$*.II. Proprietes Electriques des Solutions Solides* $Ba_3Nb_{4+x}Ti_{4-x}O_{21}$, $K_3Nb_{7+x}Ti_{1-x}O_{21}$, *et* $K_{3-x}Ba_xNb_8O_{21}$. F. STUDER, C. MERCEY, D. GROULT, J. M. CHAILLEUX, AND B. RAVEAU,* Groupe de Cristallographie et Chimie du Solide, L.A. 251 ISMRA, Universite de Caen, 14032 Caen Cedex, France. The electrical properties of $Ba_3Nb_{4+x}Ti_{4-x}O_{21}$, $K_3Nb_{7+x}Ti_{1-x}O_{21}$, and $K_{3-x}Ba_xNb_8O_{21}$ solid solutions have been investigated as functions of temperature and composition. From an evaluation of energy levels based on electrostatic potential calculations and symmetry operations on d orbitals, an energy band structure has been proposed in which the conduction and valence band are built from a π band including the M_1, O_2, and O_3 atoms of the structure $A_3M_8O_{21}$. Conductivity and thermoelectric power measurements have been discussed in terms of a hopping mechanism for the low temperatures, and in terms of a band model for the high temperatures.

Synthesis and Crystal Chemistry of $BaNd_2Ti_3O_{10}$, $BaNd_2Ti_5O_{14}$, *and* $Nd_4Ti_9O_{24}$. D. KOLAR, S. GABERSCEK, B. VOLAVSEK, H. S. PARKER, AND R. S. ROTH,* National Bureau of Standards, Washington, D.C. 20234. Two new ternary compounds $BaNd_2Ti_3O_{10}$ (1 : 1 : 3) and $BaNd_2Ti_5O_{14}$ (1 : 1 : 5) have been identified in the $BaO–Nd_2O_3–TiO_2$ system. Single crystals of the compounds were grown and unit cell dimensions and space group symmetry were determined. $BaNd_2Ti_3O_{10}$ is orthorhombic with $a = 3.8655 \pm 0.0003$, $b = 28.156 \pm 0.003$ and $c = 7.6221 \pm 0.0007$ Å and possible space groups are $Cmcm$ and $Cmc2$. The compound melts congruently at 1640 ± 20°C. $BaNd_2Ti_5O_{14}$ is also orthorhombic with $a = 22.346 \pm 0.002$, $b = 12.201 \pm 0.001$ and $c = 3.8404 \pm 0.0003$ Å and possible space groups are $Pbam$ and $Pba2$. This compound melts congruently at 1540 ± 20°C. Single crystals of the binary compound $Nd_4Ti_9O_{24}$ were also grown and found to be orthorhombic with $a = 35.289 \pm 0.003$, $b = 13.991 \pm 0.001$, $c = 14.479 \pm 0.001$ Å, space group $Fddd$.

Phases $A_nB_nO_{3n+2}$ *des Systemes* $La_2Ti_2O_7–CaTiO_3$, $Nd_2Ti_2O_7–CaTiO_3$, *et* $Ca_2Nb_2O_7–CaTiO_3$. M. NANOT,* F. QUEYROUX, J. C. GILLES, AND R. PORTIER, ESPCI-Laboratoire de Chimie du Solide Mineral, 10, rue Vauquelin 75231, Paris Cedex 05, France. The simultaneous use of X-ray diffraction and electron microscopy techniques enables us to explain the structural characteristic features of $A_nB_nO_{3n+2}$ phases in the systems $La_2Ti_2O_7–CaTiO_3$, $Nd_2Ti_2O_7–CaTiO_3$, and $Ca_2Nb_2O_7–CaTiO_3$, and the systematic twinning of the observed crystals. The latter seems to be correlated with the making, during the growth, of "defect sheets," whose symmetry element induces the orientation in position of the two twin crystals.

Lattice Imaging of Extended Defects and Related Phases in Polycrystalline $Sr(Ba)Fe_{18}O_{27}$ *(Ferrous-W)*. F. J. A. DEN BROEDER,* Philips Research Laboratories, 5600 MD, Eindhoven, The Netherlands. The defect structure of polycrystalline $SrFe_{18}O_{27}$ and $BaFe_{18}O_{27}$ (ferrous-W) was investigated by TEM using lattice fringe imaging. Various extended defects were identified in the MS sequence along the hexagonal c-direction of the W structure (M = magnetoplumbite, S = spinel). These are isolated (extra) M blocks, isolated S blocks, and in a few cases isolated S_2 and S_3 blocks, running throughout a whole W crystallite along the basal plane. These defects serve to accommodate a local deviation from the stoichiometric W composition. In regions of large concentrations of isolated S blocks or M blocks, they tend to order, forming new compounds M_2S_3, M_4S_5, or M_4S_3. A frequently occurring defect with which no local composition deviation is associated is due to a locally inverse MS sequence. It is proposed that this sequential fault originates from a growth accident.