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Abstracts of Forthcoming Articles

The Crystal Structure of Tl-β-Alumina. T. KODAMA AND G. MUTO. The Institute of Industrial Science, The University of Tokyo, 22-1, Roppongi 7-chome, Minato-ku, Tokyo 106, Japan. The crystal structure of $Tl_2O \cdot 11Al_2O_3$ has been determined from three-dimensional X-ray data. The compound forms hexagonal crystals with $a = 5.598$, $c = 22.93$ Å and $z = 1$ in space group $P6_3/mmc$. The structure has been refined by least-squares methods with anisotropic temperature factors to an R value of 0.063 for 351 independent reflections collected by diffractometry. The crystal is composed of alternate stackings of the spinel block and the ion-conducting layer, both of which are linked together by the covalently bonded corner-sharing $O_3Al–O–AlO_3$ tetrahedra along the c-axis. The occupational percentages of the mobile ion were determined from the Fourier synthesis and compared with those of Ag- and Na-β-alumina.

A Single-Crystal Diffractometry Investigation of Iron in β-Rhombohedral Boron. B. CALLMER AND T. LUNDSTRÖM. Institute of Chemistry, University of Uppsala, Box 531, S75121 Uppsala, Sweden. The structure of a crystal of composition $FeB_{\sim 49}$ has been investigated using single-crystal diffractometry. The space group is $R\bar{3}m$ and the hexagonal cell dimensions are $a = 10.951$ Å and $c = 23.861$ Å. The three-dimensional boron network is essentially equivalent to that found in β-rhombohedral boron. Two sets of holes in this network are partially occupied by iron atoms.

The Ternary UO_2–UO_3–$EuO_{1.5}$(EuO) System and Investigation of Eu(II)-Actinide(IV)-Perovskites. U. BERNDT, R. TANAMAS, AND C. KELLER. Institut für Radiochemie, Kernforschungszentrum, 75 Karlsruhe, Postfach 3640, Germany. At 1250°C, the following single-phase regions have been detected in the UO_2–UO_3–$EuO_{1.5}$ region of the ternary uranium–europium–oxygen system: (a) β-U_3O_8: no solubility for $EuO_{1.5}$ could be observed. (b) Fluorite phase: the oxygen limiting compositions are $(U, Eu)O_{2.25}$ and $(U, Eu)O_{1.79}$, respectively; the range of the stoichiometric composition MO_2 is between UO_2 and $(U_{0.36}, Eu_{0.64})O_2$, a fluorite phase with U(VI) is only obtainable for the substoichiometric region from $(U_{0.32}, Eu_{0.68})\ O_{1.98}$ to $(U_{0.24}, Eu_{0.76})\ O_{1.86}$. (c) Rhombohedral phase: It extends from $UO_3 \cdot 6EuO_{1.5}$ on the UO_3–$EuO_{1.5}$ side of the system to the $0.7UO_2 \cdot 0.3EuO_{1.5}$–$0.6UO_2 \cdot 0.4EuO_{1.5}$ line on the UO_2–$EuO_{1.5}$ side, showing an increased phase width with lowering of the uranium valency. (d) Monoclinic B-$EuO_{1.5}$: no solubility for UO_{2+x} could be observed. The first lanthanide–actinide perovskite compounds, orthorhombic $EuUO_3$ and $EuNpO_3$ could be prepared by different methods; attempts to prepare similar ternary oxides containing Th(IV), Pu(IV), and Am(IV), however, failed. EMF-measurements have proven that cubic C-$EuO_{1.5}$ is the thermodynamically stable $EuO_{1.5}$-modification below 1050 ± 20°C.

The Influence of Deviations from 1:1 Order in Perovskites on Optical Properties. K. C. BLEIJENBERG AND G. BLASSE. Physical Laboratory, State University, Sorbonnelaan 4, Utrecht, The Netherlands. Vibrational and electronic spectra of compositions $Ba_2Mg_{1-x}Li_{0.8x}W_{1+0.2x}O_6$ and $Sr_{1+x}La_{1-x}Li_{1-0.2x}$-$W_{1+0.2x}O_6$ are reported. The vibrational spectra show the presence of clusters of WO_6^{6-} octahedra. Large clusters quench the luminescence that has been found for the compositions with $x = 0$.

Intermediate Phases and Pseudophases in the System WO_3–Nb_2O_5: Tetragonal Tungsten Bronze Phases. H. OBAYASHI AND J. S. ANDERSON. Inorganic Chemistry Laboratory, University of Oxford, South Parks Road, Oxford OX1 3QR, England. Ordered intermediate phases with finely graded compositions are found in the Nb_2O_5–WO_3 system: homologous series of crystallographic shear phases for x in $MO_x (M = Nb + W) > 2.9$; a succession of block structures and intergrowth structures for $2.5 \leqslant x \leqslant 2.65$. The intermediate range has pentagonal tunnel structures partly based on the tetragonal tungsten bronze network. Ordered filling of some rational, but variable, fraction of tunnel sites could, in principle, generate a new closely graded series of phases. Synthetic experiments and lattice imaging electron