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Abstracts of Forthcoming Articles

Preparation of the $HgCr_2(Se_xS_{1-x})_4$ Type Compounds and the X-Ray Control of the Process of Formation of their Spinel Structures. I. Okonska-Kozlowska, D. Konopka, M. Jelonek, J. Heimann, J. Pietkiewicz, and A. Chelkowski. Uniwersytet Slaski, Instytut Fizyki, ul. Uniwersytecka 4, 40-007 Katowice, Poland. Compounds of the $HgCr_2(Se_xS_{1-x})_4$ type were prepared for $0.750 \leqslant x \leqslant 0.250$ by the thermal synthesis from parent elements. Individual reaction stages were controlled röntgenographically. The values of electric conductivity activation energy of the compounds have been calculated and the chemical analysis of the substances prepared has been developed.

Apatites of Divalent Europium. I. Mayer, E. Fischbein, and S. Cohen. Department of Inorganic and Analytical Chemistry, Hebrew University of Jerusalem, Israel. The preparation methods of $Eu_3(PO_4)_2$, $Eu_5(PO_4)_3F$, $Eu_3(PO_4)Cl$, and $Eu_5(AsO_4)_3OH$ are described. $Eu_3(PO_4)_2$ crystallizes in a rhombohedral unit cell and the apatite like compounds in the $P6_3/m$ hexagonal structure. All the compounds are isomorphous with the corresponding Sr compounds, and similar in size. Magnetic susceptibility measurements show that $Eu_3(PO_4)_2$ is magnetically ordered below 5°K and $Eu_5(PO_4)_3F$ and $Eu_5(PO_4)_3Cl$ are paramagnetic. Solid solution of the $Eu_{5-x}Ca_x(PO_4)_3F$ system obey Vegard's law, while the $Eu_{5-x}Ba_x(PO_4)_3F$ and $Eu_{5-x}Ba_x(PO_4)_3Cl$ systems show a trend to form ordered solid solutions.

Phase Equilibria, Thermal Analysis, and Reactivity of Tin Tungsten Bronzes and Related Phases. I. J. McColm, R. Steadman, and C. Dimbylow. School of Materials Science, University of Bradford, Bradford BD7 1DP, England. Crystal chemistry and phase relations of the bronze forming region of the Sn–W–O system have been investigated. Above 780°C the tin bronzes Sn_xWO_3 are shown to be thermally unstable and an equilibrium diagram is established at 700°C which shows that the composition limits of the tetragonal phase are $0.21 \leqslant x \leqslant 0.29$. Below $x = 0.21$ a series of single and two-phase regions containing orthorhombic bronzes exists for which the composition limits have been established. In the range $0.29 \leqslant x \leqslant 0.76$ the system comprises the tetragonal bronze, $Sn_2W_3O_8$ and $SnWO_4$, while above 0.76 there is no bronze, only $Sn_2W_3O_8$, $SnWO_4$ and free Sn. The phase $Sn_2W_3O_8$ has been isolated and shown to have a hexagonal unit cell, $a = 7.696$ Å, $c = 18.654$ Å. The evidence of differential thermogravimetric analysis (DTA) and X-ray studies suggests that this hexagonal phase arises from the decomposition of the tungsten bronze phase and is itself decomposed to cubic $SnWO_4$ above 700°C. Small thermal effects observed in the DTA scans of tin-containing tetragonal bronzes are interpreted in terms of an order–disorder phenomenon arising from asymmetric tunnel occupancy by Sn^{2+} ions caused by the presence of the lone pair of electrons. Hydrogen reduction of Sn_xWO_3 has been shown to result in complete removal of oxygen, producing Sn + α-W in the range 600–850°C. Some activation energy data are given for the reduction process.

Structural Relationships, Crystal Chemistry and Anion Substitution Processes for $M(III)X_3$ Systems of the Lanthanides and Actinides. J. M. Haschke. Department of Chemistry, University of Michigan, Ann Arbor, Michigan 48104. An examination of data for lanthanide and actinide phases with UCl_3-type and $PuBr_3$-type $M(III)X_3$ structures has shown that these systems are conveniently described by alternating layers of $[MX_2]_n^{n+}$ and $[X]_n^{n-}$. The relationships between the UCl_3- and $PuBr_3$-type structures are described and expanded to include a variety of anion substitution systems, $M(III)X_{3-x}Y_x$. The two different types of $[MX_2]_n^{n+}$ layers observed in these systems are consistent with the existence of a novel structural unit, $[M_2X_4]^{2+}$. The effects of radius ratio constraints and layering mechanisms on the phase equilibria and anionic substitution processes, polymorphism and crystal growth in the $MX_{3-x}Y_x$ systems are discussed.

Chemical Self-Diffusion in CdTe. S. S. Chern and F. A. Kröger. Department of Materials Science, University of Southern California, Los Angeles, California 90007. The diffusion constant determining the rate of variation in the stoichiometric composition of CdTe for a change in cadmium pressure is

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