solution (x = 0.14; 0.29; 0.43) are established in the temperature range 1220–1305°C. It is shown that in the reaction zone of interacting NiO, (Ni, Zn)O, or ZnO with Fe_2O_3 the ferrite phase crystallizes only on iron oxide. The distribution of the Fe, Ni, and Zn concentrations over the reaction layer thickness using electron probe and X-ray spectrum analysis is obtained. The interdiffusion coefficients over the investigated temperature range calculated in the (Ni, Zn, Fe)O and ferrite phases change from $(0.8–7.0) \times 10^{-9}$ to $(1.0–12.0) \times 10^{-10}$ cm^2/sec, respectively. The interaction of (Ni, Zn)O with Fe_2O_3 takes place by the mechanism of interaction of interdiffusion of Fe^{3+}, Fe^{2+}, and Ni^{2+}, Zn^{2+} along with a current of Zn^{2+} ions and electrons or oxygen ions directed to the ferrite/Fe_2O_3 interface.

Phase Equilibrium Relations in the Binary systems $LiPO_3$–CeP_3O_9 and $NaPO_3$–CeP_3O_9. M. Rzaigui and N. Kbir Ariguib,* Laboratoire de Physico-Chimie Minérale, Ecole Normale Supérieure, 43, Rue de la Liberté, Le Bardo, Tunis. The $LiPO_3$–CeP_3O_9 and $NaPO_3$–CeP_3O_9 systems have been investigated for the first time by DTA, X-ray diffraction, and infrared spectroscopy. Each system forms a single 1:1 compound. $LiCe(PO_3)_4$ melts in a peritectic reaction at 980°C. $NaCe(PO_3)_4$ melts incongruently, too, at 865°C. These compounds have a monoclinic unit cell with the parameters: a = 16.415(6), b = 7.042(6), c = 9.772(7) Å, β = 126.03(5)°, Z = 4, space group $C2/c$ for $LiCe(PO_3)_4$ and a = 9.981(4), b = 13.129(6), c = 7.226(5) Å, β = 89.93(4)°, Z = 4, space group $P2_1/n$ for $NaCe(PO_3)_4$. It is established that both compounds are mixed polyphosphates with chain structure of the type $|M_{\mathrm{I}}^{\mathrm{I}}\ M_{\mathrm{II}}^{\mathrm{III}}(PO_3)_4|_\infty$ $M_{\mathrm{I}}^{\mathrm{I}}$: alkali metal, $M_{\mathrm{II}}^{\mathrm{III}}$: rare earth.

Phase Relations in the Ternary W–Mo-O System. T. Ekström, E. Salje, and R. J. D. Tilley,* School of Materials Science, University of Bradford, Bradford BD7 1DP, West Yorkshire, United Kingdom. The phases in the ternary W–Mo–O system have been determined using X-ray diffraction and electron microscopy. Series of mixed crystals occur for the fully oxidized compounds $W_xMo_{1-x}O_3$. Slightly reduced crystalline samples consist of *CS* phases containing {102} *CS* planes which are ordered when the Mo content is high. These latter have overall compositions $(W_xMo_{1-x})_n O_{3n-1}$, with n increasing with increasing W-content from 9 to 16. More substantially reduced crystals show less tendency to form mixed crystals. In samples of overall composition near to $M\ O_{2.90}$ phase separation occurs into {102}-containing *CS* phases which are molybdenum rich and {103} *CS* phases which are tungsten rich. The tungsten oxides $WO_{2.82}$ and $W_{18}O_{49}$ seem to contain little or no Mo. These results are summarized in a phase diagram.

The Structure of Cubic $YbZrF_7$. M. Poulain and B. C. Tofield,* Materials Development Division, AERE Harwell, Oxon, OX11 ORA, United Kingdom. The structure of primitive-cubic $YbZrF_7$ has been determined using X-ray and neutron diffraction techniques. A unit cell (a = 4.07 Å, space group $Pm3m$) contains one formula unit of $Yb_{0.5}Zr_{0.5}F_{3.5}$, with no ordering of cations, in materials prepared by rapid quenching from 1000°C. Metal and fluorine displacements from ideal sites are in accord with results previously obtained on $Zr_{0.8}Yb_{0.2}\ F_{3.2}O_{0.3}$. The separation between F–F pairs bridging neighboring metal ions is similar to those observed in other complex zirconium fluorides. The metal displacements, metal–fluorine distances and fluorine–fluorine distances are discussed with respect to the formation and stability of disordered fluorine-excess ReO_3-type phases. These materials are intermediate in character between phases such as monoclinic $YbZrF_7$, with perfect order on both metal and nonmetal sublattices, and ZrF_4-based glasses, where there is disorder on the metal as well as on the fluorine sublattice. No ordering effects are observed on heating to near 200°C, but near 400°C there is a slow transformation to the monoclinic $YbZrF_7$ structure.