coefficient which can be deduced is high, but the carrier number is limited through formation of vacancy pairs tending to give 4 coordination for iron.

Surface Instability and Nonstoichiometry of α-Fe_2O_3. J. H. W. DeWit,* A. F. Broersma, and M. Stroband, Inorganic Chemistry Department, University of Utrecht, Croesestraat 77A, 3522 AD Utrecht, The Netherlands. The thermodynamic stability region of α-Fe_2O_3 is investigated by thermogravimetric measurements. By means of electron microscopy, the surface of the grains of sintered compacts is shown to be already reduced well within the α-Fe_2O_3 stability region. Based on this information an electrical conductivity model is presented, in which the inhomogeneous character of the nonstoichiometry of the grains is emphasized.

Mössbauer Studies of Thiospinels.III. The System $FeCr_2S_4$–$FeIn_2S_4$. E. Riedel* and R. Karl, Institut für Anorganische und Analytische Chemie, Technische Universität Berlin, D-1000 Berlin 12, Germany. Polycrystalline samples of spinel compounds $FeCr_{2-x}In_xS_4$ have been obtained in the range $0 \leq x \leq 2$. The nonlinear changes of the cell parameters are explained by the nonlinear behavior of the inversion parameter λ according to the ionic distribution $Fe^{2+}_{1-\lambda}In^{3+}_{\lambda}[Cr^{3+}_{2-x}Fe^{2+}_{\lambda}In^{3+}_{x-\lambda}]S^{2-}_4$. Room-temperature ^{57}Fe-Mössbauer spectra exhibit two sets of absorptions for tetrahedrally and octahedrally coordinated Fe, respectively, each consisting of several overlapping doublets of similar isomer shifts but varying quadrupole splittings. The partial intensity of octahedral site Fe is in agreement with λ. The spectra can be understood by accounting for the influence of variable octahedral-site neighbors on tetrahedral-site iron.

Mössbauer Studies of Thiospinels.IV. The System $FeCr_2S_4$–Fe_3S_4. E. Riedel* and R. Karl, Institute für Anorganische und Analytische Chemie, Technische Universität Berlin, D-1000 Berlin 12, Germany. Spinel compounds of the composition $Fe_{1+x}Cr_{2-x}S_4$ with $0 \leq x \leq 0.5$ have been prepared in polycrystalline form. The ionic distribution $Fe^{2+}[Cr^{3+}_{2-x}Fe^{3+}_x]S^{2-}_4$ is derived from both X-ray and ^{57}Fe-Mössbauer data. Room-temperature Mössbauer spectra show the typical behavior of tetrahedral-site Fe^{2+} surrounded by different octahedral-site neighbors. Octahedral-site Fe^{3+} absorbs as a doublet with $\Delta \approx 0.5$ mm/sec. Samples of overall composition $FeCr_2S_4$ consist mainly of a spinel $Fe^{2+}[Cr^{3+}_{2-y}Fe^{3+}_y]S^{2-}_4$, $y \approx 0.02$.

Crystal Data and Phase Transitions of $KLiWO_4$ and $KLiMoO_4$. K. Okada* and J. Ossaka, Department of Inorganic Materials, Tokyo Institute of Technology, O-okayama, Meguro, Tokyo 152, Japan. Crystal data and phase transitions of $KLiWO_4$ and $KLiMoO_4$ were investigated using a high-temperature X-ray powder diffractometer. Phase transitions were observed at 350°C for $KLiWO_4$ and 360°C for $KLiMoO_4$. It was found that the room-temperature phases were isostructural with stuffed derivatives of tridymite and the high-temperature phases were isostructural with stuffed derivatives of cristobalite.

Champ de Force et Caracterisation des Liaisons dans Les Niobates et Tantalates de Structure de Type "Blocs 1 × 2." Y. Repelin,* E. Husson, and H. Brusset, Laboratoire de Chimie et Physico-Chimie Minerales, Institut de Chimie Ecole Centrale des Arts et Manufactures, 92290-Chatenay-Malabry, France. The vibrational study of the three families of the niobates and tantalates of "1 × 2 block"-type structure shows that some vibrational frequencies are characteristic of this structure. The relation between the calculated force constants and the structural characteristics permitted us to distinguish the different types of Nb–O and Ta–O bonds from each other, and to establish a relation between the polarizability of the divalent cation and the mode of linkage of the double octahedra in the layer planes. Finally, the comparison of these results with those obtained for other niobates and tantalates of various structures permitted us to determine the relative stability of all these compounds.

Phenomenological and Structural Study of a Low Temperature Phase Transition in the $PbZrO_3$–$PbTiO_3$ System. A. Amin,* R. E. Newnham, L. E. Cross, and D. E. Cox, Materials Research Laboratory, The Pennsylvania State University, University Park, Pennsylvania 16802. The Landau–Ginsburg–Devonshire Phenomenological theory has been applied to the $PbZrO_3$–$PbTiO_3$ crystalline solid solution system to explore the behavior of the rhombohedral:tetragonal morphotropic phase