Structure Cristalline et Polymorphisme du Nitrate de Cadmium Anhydre. M. Louër, D. Louër, and D. Grandjean, Université de Rennes, Laboratoire de Cristallochimie, Avenue du Général Leclerc, 35031 Rennes-Cédex, France. $Cd(NO_3)_2$ undergoes a phase transition at 160°C. The high-temperature form is cubic and isomorphic with $M(NO_2)_3$ ($M =$ Ba, Ca, Sr, Pb). The crystal structure of the low temperature phases has been solved by X-ray diffraction at 20°C, using 774 independent reflections collected with a four-circle diffractometer. The dimensions of the orthorhombic unit cell are: $a \simeq c = 7.5073$ (14) Å, $b = 15.3692$ (35) Å, $Z = 8$, space group $Pca2_1$. The structure has been refined to the final weighted $R = 0.044$. The cadmium atoms are nearly in a face-centered arrangement. Each cadmium is octahedrally surrounded by six oxygen, the Cd–O distances varying from 2.34 to 2.46 Å. Each nitrate group belongs through its three oxygens to three different octahedra. The structural change cubic $Cd(NO_3)_2 \rightarrow$ orthorhombic $Cd(NO_3)_2$ is characterized by a small rotation of NO_3 groups in their plane; the face-centered array of cadmium atoms is only slightly modified. The coordination of cadmium atoms changes from 12 to 6, and the approximate doubling of parameter b as well as the difference of symmetry can be explained by two different directions of rotation of the NO_3 groups situated in the same plane.

Sur un Diagramme Ionicite-Structure pour les Composes Intercalaires Alcalins des Sulfures Lamellaires. Jean Rouxel, Laboratoire de Chimie Minérale A, B.P. 1044-44037 Nantes-Cédex, France. The structure of alkali-metal intercalation compounds in layer disulfide host lattices is discussed. The sulfur surrounding of the alkali-metal (octahedral or trigonal prismatic) is a function of the size of the A^+ ion, the amount of intercalated atoms, the nature of the T–S bond. It is possible to study the relationship between the structural models and the ionicity of the bonds. Such a diagram could be used to predict the structures to be expected. A discussion of the second stage phases is given.

Phase Equilibria in the System $MnO–TiO_2–Ti_2O_3$ at 1473°K. I. E. Grey, C. Li, and A. F. Reid, CSIRO Division of Mineral Chemistry, P.O. Box 124, Port Melbourne, Victoria 3207, Australia. The oxygen fugacity-composition isotherm at 1473°K has been established for the $MnO–TiO_2–Ti_2O_3$ system for f_{O_2} in the range $10^{-13.5}–10^{-18}$ atm. The quenching method was used and control of oxygen fugacity achieved with CO_2/H_2 mixtures. Phase equilibria results are presented for the reduced rutile Magneli phases, $Ti_nO_{2n-1}–MnTi_{n-1}O_{2n-1}$, and for the partial solid solutions Ti_3O_5–"$MnTi_2O_5$" (M_3O_5), $Ti_2O_3–MnTiO_3$ (α-oxide) and $MnTi_2O_4–Mn_2TiO_4$ (spinel). Loss of manganese by volatilization is a problem in this system at low oxygen fugacities.