with A-type trigonal structure (La_2O_3, Pr_2O_3, Nd_2O_3, Sm_2O_3) and B-type monoclinic structure (Sm_2O_3, Eu_2O_3, Gd_2O_3) are compared. The B form (C_{2h}^3 or $C2/m$, $Z = 6$) derives from the A form (D_{3d}^3 or $P\bar{3}ml$, $Z = 1$) by a slight lattice deformation, implying a splitting of D_{3d} and C_{3v} atomic positions into less symmetrical C_{2h} and C_s sites. This close structural relationship allows one to relate the Raman active modes of the B-type crystals to vibrations of the A-type crystals and to deduce an interpretation of the complex B-type spectra from those of the simpler A-type spectra. Furthermore, it is shown that the frequency of the modes which mainly involve metal–oxygen stretching motion increases with the lanthanide atomic number in the A and B series. This evolution is interpreted in terms of increasing the compactness of the structure.

The Crystal Structure of α-$SrMnO_3$. K. Kuroda,* N. Ishizawa, N. Mizutani, and M. Kato, The Department of Inorganic Materials, Faculty of Engineering, Tokyo Institute of Technology, Ookayama, Meguro-ku, Tokyo, 152, Japan. α-$SrMnO_3$ crystallizes in the hexagonal system with unit-cell dimensions $a = 5.454(1)$ Å, $c = 9.092(2)$ Å, space group $P6_3/mmc$, $Z = 4$. The structure was solved by the heavy atom method; of 404 unique reflections measured by the counter method, 203 that obeyed the condition $|F_0| \geq 3\sigma(|F_0|)$ were used in the refinement to a conventional R value of 0.043. The structure consists of four close-packed SrO_3 layers in an $ABAC$ stacking sequence along the hexagonal c axis. Oxygen octahedra containing Mn^{4+} are grouped into face-sharing pairs linked by corner sharing within the cubically stacked "A" layer.

A New Tungsten Trioxide Hydrate, $WO_3 \cdot \frac{1}{3}H_2O$: Preparation, Characterization, and Crystallographie Study. B. Gerand, G. Nowogrocki, and M. Figlarz,* Université de Picardie, Départment de Chimie, 33, rue Saint Leu, 80039 Amiens, France. A new hydrate of tungsten trioxide, $WO_3 \cdot \frac{1}{3}H_2O$ has been obtained by hydrothermal treatment at 120°C of an aqueous suspension of either tungstic acid gel or crystallized dihydrate. This hydrate has been characterized by different methods. Crystallographic study was carried out from X-ray powder diffraction. The hydrate crystallizes in the orthorhombic system: $a = 7.359(3)$ Å, $b = 12.513(6)$ Å, $c = 7.704(5)$ Å, $Z = 12$. The existence of structural relationships between the hydrate, $WO_3 \cdot \frac{1}{3}H_2O$, and the product of dehydration, hexagonal WO_3, has permitted us to propose a structural model in agreement with the experimental data. $WO_3 \cdot \frac{1}{3}H_2O$ must be regarded as an interesting compound because its dehydration leads to a new anhydrous tungsten trioxide, hexagonal WO_3.

High-Pressure Phase Relations of CsD_2PO_4. A. I. Kingon, J. B. Clark,* and K. Gesi, National Physical Research Laboratory, P.O. Box 395, Pretoria 0001, South Africa. The high-pressure phase diagram of CsD_2PO_4 to 4.5 GPa and temperatures between 0 and 470°C is reported. Comparisons are made with CsH_2PO_4 and correlated with the isotope effect on the high temperature, high-pressure phase relations of KH_2PO_4.

Structure and Phase Transitions of the Lanthanide Metals. R. H. Langley, Department of Chemistry, University of Wisconsin, River Falls, Wisconsin 54022. The structures and phase transitions of the lanthanide metals can be related to f orbital contributions to the bonding. With increasing availability of the f orbitals the structure sequence hexagonal closest packed, double hexagonal closest packed, δ-samarium, cubic closest packed, and body-centered cubic is observed. Increases in temperature and/or pressure result in an increased availability of the f orbitals, resulting in predictable phase transitions.