an R value of 0.058 for 1341 observed reflections, by conventional methods using automated four-circle diffractometer data. This structure can be visualized as a fluorite-related superstructure, the large difference between the ionic radii of Re^{7+} and Y^{3+} being favorable to cation ordering. The heating to 500°C of this phase under atmospheric pressure leads to a disordered fluorite structure of the form $Y_3ReO_8\alpha$. An intermediary metastable phase $Y_3ReO_8\alpha'$ is obtained by heating a $Y_3ReO_8\beta$ single crystal to 350°C. The structural relations among these three crystalline forms of Y_3ReO_8 and the fluorite structure are discussed.

Relation between the Crystal Structures of Some Salts of the Type $Me(OCOCH_3)_2 \cdot nH_2O$ and Their Ability to Form Mixed Crystals or Double Salts (Me^{2+} = Mg, Ca, Mn, Co, Ni, Cu, Zn, Cd). CHR. BALAREW AND D. STOILOVA,* Chemical Reagents and Preparations Laboratory, Bulgarian Academy of Sciences, Sofia 1040, Bulgaria. An attempt is made to find the relation between the crystal structures of some salts of the type $Me(OCOCH_3)_2 \cdot nH_2O$ (Me^{2+} = Mg, Ca, Mn, Co, Ni, Cu, Zn, Cd) and their ability to form mixed crystals or double salts, by taking into account the difference in the ground-state configurations of the metal (II) ions. Such a treatment is based on the theoretical argument that the formation of isomorphous and isodimorphous mixed crystals occurs when the admixed ion may assume the coordination environment of the substituted ion in the crystal structure of the host salt. Double salts are formed mainly between the acetates of the d^5-, d^{10}-, and p^6-metal ions, i.e., for ions that allow strong angular deformations of the coordination polyhedra or when at least one of the metal ions meets this condition so that acetate bridge bonding may occur.

Neutron Powder Diffraction on $RbCrI_3$ and Magnetic Measurements on $RbCrI_3$ and $CsCrI_3$. H. W. ZANDBERGEN* AND D. J. W. IJDO, Gorlaeus Laboratories, University of Leiden, P.O. Box 9502, 2300 RA Leiden, The Netherlands. β-$RbCrI_3$ (a = 13.772(3), b = 8.000(2), c = 7.069(2) Å, β = 95.85(1)°, z = 4, $C2m$ at 293 K) and γ-$RbCrI_3$ (a = 13.586(2), b = 7.923(2), c = 14.094(3) Å, β = 96.88(1)°, z = 8, $C2$ at 1.2 K) are isostructural to β-$RbCrCl_3$ and γ-$RbCrCl_3$ and are both Jahn Teller distorted $BaNiO_3$ structures. In both compounds elongated octahedra occur. γ-$RbCrI_3$ has most probably a magnetic spiral structure at 4.2 and 1.2 K. Theoretically a spiral propagating along the b-axis is expected. A model with $\mathbf{k} = 9/19\mathbf{b}^*$ yielded the best result. However, no good fit was obtained possibly because of a misfit in $\mathbf{k}$ and canting of the magnetic moments due to anisotropy. χ vs T single-crystal measurements on β-$CsCrI_3$ are in accordance with its magnetic structure. The 3-d magnetic ordering temperature T_c is estimated as 27(1) K. From the χ vs T curves of γ-$RbCrI_3$ T_c could not be determined. From fits to χ vs T powder data J/k of $CsCrI_3$ and $RbCrI_3$ are estimated to be −14(2) and −11(1) K, respectively.

Solid State Reaction between p-Benzoquinone and Dihydroxybenzene. N. B. SINGH* AND H. C. SINGH, Department of Chemistry, Gorakhpur University, Gorakhpur (U.P.), India. Reaction kinetics of *p*-benzoquinone-*p*-dihydroxybenzene; *p*-benzoquinone-*m*-dihydroxybenzene, and *p*-benzoquinone-*o*-dihydroxybenzene systems have been studied in the solid state using capillary, gravimetric, and dilatometric techniques. It is found that *p*-benzoquinone is the diffusing species. The diffusion occurs through surface migration and depends very much on the symmetry of the dihydroxybenzene molecules. Gravimetric studies indicate that cracks are formed in the product during reaction and that the reaction reaches completion. Dilatometric studies indicate that the reaction products are more compact and contraction in volume takes place during the course of reaction.