free-ion factor is assumed. These results can be interpreted in terms of an extended spin density distribution due to covalent bonding in the ReO_6 clusters.

Les Phases Na_4XO_4 ($X = Si, Ti, Cr, Mn, Co, Ge, Sn, Pb$) et K_4XO_4 ($X = Ti, Cr, Mn, Ge, Zr, Sn, Hf, Pb$). R. Olazcuaga, J. M. Reau, M. Devalette, G. Le Flem, and P. Hagenmuller. Service de Chimie Minérale Structurale de l'Université de Bordeaux I, C.N.R.S., 351 cours de la Libération, 33405 Talence, France. The isotypic Na_4XO_4 (X = Si, Ti, Cr, Mn, Co, Ge, Sn, Pb) and K_4XO_4 (X = Ti, Cr, Mn, Ge, Zr, Sn, Hf, Pb) phases crystallize in the triclinic system. Optical and magnetic properties of the chromium, manganese and cobalt compounds show that the transition element has a tetrahedral surrounding.

First Order Magnetic Transition, Magnetic Structure and Vacancy Distribution in Fe_2P. R. Wäppling, L. Häggström, T. Ericsson, S. Devanarayanan, E. Karlsson, B. Carlsson, and S. Rundqvist. Institute of Physics and Chemistry, Uppsala University, S-751 21 Uppsala 1, Sweden. The para to ferromagnetic transition in Fe_2P has been studied using Mössbauer spectroscopy. The magnetic hyperfine fields drop abruptly from about half of their saturation values to zero at 214.5°K indicating a first order transition. The isomer shifts show a discontinuous change at the transition point. For some samples the transition takes place over a wide temperature range, probably due to impurities and other imperfections in the samples. From the magnetic hyperfine fields at 15°K the magnetic moments can be deduced to be 1.14 μB and 1.78 μB for Fe(1) and Fe(2), respectively. An assignment of the components in the Mössbauer spectra to the two crystallographically nonequivalent iron positions has been made from the temperature variation of the spectra. The ordering of metal vacancies has been investigated by a Mössbauer study of a nonstoichiometric Fe_2P sample and by an X-ray diffraction study of a nonstoichiometric Mn_2P crystal.

Mössbauer and X-Ray Studies of Fe_5PB_2. L. Häggström, R. Wäppling, T. Ericsson, Y. Andersson, and S. Rundqvist. Institute of Chemistry and Institute of Physics, Uppsala University, S-751 21 Uppsala 1, Sweden. Mössbauer spectroscopic and X-ray crystallographic studies of the ternary compound Fe_5PB_2 have been undertaken. It is suggested that in the nonstoichiometric compound part of the phosphorus positions are occupied by boron atoms. The Mössbauer data indicate that Fe_5PB_2 is a simple ferromagnet with the tetragonal axis as the direction of easy magnetization, the moments being ~1.6 μB and ~2.2 μB for Fe(1) and Fe(2), respectively.

Les Bronzes de Cobalt K_xCoO_2($x < 1$). L'Oxyde $KCoO_2$. C. Delmas, C. Fouassier, and P. Hagenmuller. Service de Chimie Minérale Structurale de l'Université de Bordeaux I, C.N.R.S., 351 cours de la Libération, 33405 Talence, France. The reaction between potassium and cobalt oxides leads to two bronze-type phases with formula K_xCoO_2 ($x = 0.50$ and $x = 0.67$) and to a $KCoO_2$ oxide with two allotropic forms. The lattice of K_xCoO_2 is built up by sheets of $(CoO_2)_n$ octahedra between which potassium ions are inserted with a prismatic coordination; they have a metallic behaviour. The structures of both $KCoO_2$ varieties are related to the cristobalite type. The oxidations state of cobalt is discussed on the basis of structural, optical and magnetical data.