paramagnetic to 4.2°K. The evidence suggests that $PrAl_2$ and $CaAl_2$ are electronically similar with regard to band structure and both differ in band structure from that in $GdAl_2$.

Crystal Structure and Magnetic Properties of $Ba_2Ni_3F_{10}$. M. LeBlanc, G. Ferey, and R. de Pape, Laboratoire des Fluorures et Oxyfluorures Ioniques, Route de Laval, 72017 Le Mans Cedex, France. $Ba_2Ni_3F_{10}$ is monoclinic (space group $c2/m$) $a = 18.542$ (7) Å, $b = 5.958$ (2) Å, $c = 7.821$ (3) Å, $\beta =$ 111° 92 (10). $Ba_2Co_3F_{10}$ and $Ba_2Zn_3F_{10}$ are isostructural. The structure has been refined from 995 reflections by full-matrix least-squares refinement to a weighted R value of 0.048 (unweighted R: 0.047). The three-dimensional network can be described either by complex chains connected to each other by octahedra sharing corners or with a 18L dense packing sequence. The basic unit $(Ni_3F_{10})^{4-}$ is discussed and compared to a different one existing in $Cs_4Mg_3F_{10}$. Antiferromagnetic properties of $Ba_2Ni_3F_{10}$ ($T_N = 50$ K) are described.

Infrared Spectrum of Several Double Oxides with Corundum Structure Resulting from the Transformation of Lacunar γ Phases with a Spinel Structure. B. Gillot, F. Bouton, F. Chassagneux, and A. Rousset, Laboratoire de Recherches sur la Réactivité des Solides, BP 138, 21004 Dijon, Cedex, France. When aluminum or chromium is substituted by Fe^{3+} ions in α-Fe_2O_3, all the ir bands gradually shift toward high frequencies. Alternatively, for the α phases of type $(Fe_2Cr_{4-y}Al_y)O_9$ the transition occurs sharply for a composition y close to 2. For α phases substituted by $(Fe_{6-y}Cr_y)O_9$-type chromium a linear variation of frequency with chromium content is observed. From ir data it has been shown that, under given temperature and time conditions, an α phase less rich in chromium than the initial product could be obtained by oxidizing iron chromite. The ir spectrum of the oxidation of pure magnetites whose size is between 1400 and 15 000 Å evolves versus the latter to yield either the γ-Fe_2O_3 or the α-Fe_2O_3 phase which can be formed from γ-Fe_2O_3 or by direct oxidation of Fe_3O_4.

Preparation and Mössbauer Effect of $Cr_{1-x}Fe_xOOH$ ($0 \leq x \leq 1.0$) with the InOOH-Type Structure. K. Yabuta, N. Kinomura, M. Shimada, F. Kanamaru, and M. Koizumi, The Institute of Scientific & Industrial Research, Osaka University, Osaka 565, Japan. The complete solid solutions of $Cr_{1-x}Fe_xOOH$ with the InOOH-type structure were synthesized under high pressures. They were antiferromagnetic with Néel temperatures 570 K for FeOOH, 454 K for $Cr_{0.2}Fe_{0.8}OOH$, 332 K for $Cr_{0.4}Fe_{0.6}OOH$, and 160 K for $Cr_{0.6}Fe_{0.4}OOH$ determined by the Mössbauer effect measurements.

Synthese et Caracterisation Cristallographique et Physique d'une Serie de Composes $ACu_3Ru_4O_{12}$ de Type Perovskite. M. Labeau, B. Bochu, J. C. Joubert, and J. Chenavas, Laboratoire de Génie Physique, ENSIEG, BP 46, 38402, Saint-Martin-D'Heres, France. A series of ruthenates with the perovskite-like arrangement has been synthesized. The general formula is $(ACu_3)(Ru_4)O_{12}$ where (ACu_3) and (Ru_4) occupy the A and B sites of the ideal ABO_3 perovskite structure, respectively; $A = Na^+$, Ca^{2+}, Sr^{2+}, Cd^{2+}, La^{3+}, Pr^{3+}, and Nd^{3+}. The change of the A site charge is balanced by a change of the ruthenium valence (+3, +4, or +5). The stability of the structure is strongly related to the relative size of the cations on the dodecahedral and octahedral sites. The magnetic susceptibility of the compounds with $A =$ Na, Ca, and La is temperature independent above 70°K (for Ca), 120°K (for La) or 220°K (for Na) (Pauli paramagnetism). Resistivity measurements made on sintered samples between 77 and 300°K confirm the metallic nature of these compounds.

Crystal Structure of $Na_3PCr_3O_{13} \cdot 3H_2O$, A New Type of Chromophosphoric Anion. M. T. Averbuch-Pouchot, A. Durif, and J. C. Guitel, Laboratoire de Cristallographie, CNRS 166X, 38042 Grenoble Cedex, France. We describe chemical preparation and crystal structure of a new sodium phosphochromate: $Na_3PCr_3O_{13} \cdot 3H_2O$. This salt is orthorhombic with $a = 11.72(3)$, $b = 14.89(3)$, $c = 16.59(3)$ Å, and $Z = 8$, Space group: $Pbc2_1$. The final R value is 0.063 for 2133 independent reflexions. The main feature of this atomic arrangement is the existence of a new type of chromophosphoric anion: PCr_3O_{13}. Infinite chains of NaO_6 run along the **a** direction. A survey of some phosphochromates previously described by the authors is given.

Semiconductivity, Optical Properties, and EPR Spectra of Phenothiazine Derivatives in the Solid State. A. Ortiz, J. I. Fernández-Alonso, A. Pardo, and J. Llabres, Departamento de Quimica-Física y Química Cuántica, Universidad Autonoma de Madrid, Cantoblanco, Madrid, 34, Spain. The optical, EPR, and electrical properties of phenothiazine derivatives have been investigated as a function of R_2 substituents. Diffuse reflectance spectra show a charge transfer complex transition between 600 and