Magnetic and Electrical Properties in the Defect Perovskite System $La_{1-x}Na_xFeO_{3-\delta}$. HIROSHI YAMAMURA*, HAJIME HANEDA, SHIN-ICHI SHIRASAKI, AND KOU TAKADA, National Institute for Research in Inorganic Materials, 1-1, Namiki, Sakura-Mura, Niihari-Gun, Ibaraki, Japan. Magnetic and electrical properties were studied for the defect perovskite system $La_{1-x}Na_xFeO_{3-\delta}$. X-Ray diffraction showed that the materials with a composition range $x = 0.0$–0.25 were monophasic perovskite-like compounds with orthorhombic symmetry. The present ferrite solid–solution showed a parasitic-ferromagnetic property, accompanying the antiferromagnetism. Both values of the ferromagnetic moment and the magnetic susceptibility increased with increase in Na content. Furthermore, the magnetization was strongly affected by oxygen partial pressure. These experimental facts seem to have a close relation with the oxygen vacancies. Electrical conductivity measurements suggested the presence of mixed valencies of Fe^{3+} and Fe^{4+} on a basis of the compositional dependence of the conductivity and its activation energy.

Etude structurale des composés $Fe_{0.25}TiSe_2$ *et* $Co_{0.25}TiSe_2$ *à cristaux maclés. Surstructures et degré d'ordre des lacunes.* Y. ARNAUD AND M. CHEVRETON*, Laboratoire d'Etude des Matériaux (ERA 602) Bt 303, INSA, 20 avenue Albert-Einstein, 69621 Villeurbanne Cédex, France. $Fe_{0.25}TiSe_2$ and $Co_{0.25}TiSe_2$ crystals have been studied. Meriedric twins are detected by means of X-ray diffraction, from extinction rules observed on the apparent cells that are multiples of the *C*6 hexagonal unit cell (a', c'). In $Fe_{0.25}TiSe_2$ [quasi-orthohexagonal monoclinic I true unit cell: a ($\approx a'3^{1/2} = 3.566(1) \times 3^{1/2}$; b ($\approx a'$) = 3.566(1); c ($\approx 2c'$) = 5.964(1) × 2 Å; $\beta \approx 90°$] existence of a M_3X_4 ordering of vacancies, previously observed on powders, is confirmed by this study. In $Co_{0.25}TiSe_2$, the true unit cell is monoclinic F ($a \approx 2a'3^{1/2}$, $b \approx 2a'$, $c \approx 2c'$). The basic *C*6 lattice is apparently undistorted and the structure may be described through an hexagonal unit cell ($a_1 = b_1 = 2a'$; $c_1 = 2c'$); on the studied crystal we have found a_1 = 7.1014(9); b_1 = 7.0993(8); c_1 = 11.800(2) Å; γ_1 = 119.97(3)°. The structure refinement ($R = 0.036$ from 120 "*C*6" reflections; $R = 0.056$ from 70 superstructure reflections) is carried out with the $M_5\,\square_3X_8$ model, $2c'$ variety, space group $C2/m$. Assuming Co atoms to be in vacancy-containing layers, occupation rates of 0.55 on "metal" sites and 0.092 on "vacant" sites are found.