Magnetic Susceptibility of $MnIn_2S_4$. C. Hsu, J. J. Steger, E. A. DeMeo, A. Wold, and G. S. Heller. Division of Engineering and Department of Chemistry, Brown University, Providence, Rhode Island 02912. Recent magnetic resonance results suggest that $MnIn_2S_4$ is antiferromagnetic with a Néel point near liquid helium temperature, in disagreement with previously reported dc susceptibility measurements. The resonance data suggest that these susceptibility measurements were made at an applied dc field comparable to or greater than the critical field. This would tend to obscure observation of a magnetic transition, since some of the spins would be "flopped." The susceptibility measurements have been repeated at a much lower applied field. From these new measurements, a Néel temperature of 4.9°K is obtained, in agreement with the resonance data, and an exchange parameter of 1430 is computed.

Variation of Lattice Parameters in TiS–VS Solid Solutions. H. F. Franzen, D. H. Leebrick, and F. Laabs. Ames Laboratory-USAEC and Department of Chemistry, Iowa State University, Ames, Iowa 50010. Results of measurements of lattice parameters and densities in nonstoichiometric solid solutions of titanium and vanadium monosulfide are reported and discussed. The results indicate that a second-order phase transition from the NiAs-type to MnP-type structure occurs at an intermediate composition, and that the phase transition is accompanied by a marked change in the rate of change of the metal–metal distances in the *c*-axis direction.

Magnetic Properties of $Gd_{1-x}Th_xFe_2$ and $Gd_{1-x}Ce_xFe_2$. E. T. Miskinis, K. S. V. L. Narasimhan, W. E. Wallace, and R. S. Craig. Department of Chemistry, University of Pittsburgh, Pennsylvania 15260. Saturation magnetization, magnetization vs temperature, Curie temperatures and lattice parameters are presented for the ternary alloys $Gd_{1-x}Th_xFe_2$ and $Gd_{1-x}Ce_xFe_2$. Quadrivalent Th and Ce were introduced into the lattice in an effort to induce ferromagnetic Gd–Fe coupling. Experiment showed that the antiferromagnetic Gd–Fe coupling in $GdFe_2$ is preserved in the ternaries. The Fe moment and Curie temperature decrease as the Gd content of the sample is decreased. This is ascribed to electron transfer from Th or Ce to the Fe *d*-shell. Failure to achieve ferromagnetic coupling is ascribed to electron capture by iron, which prevents a rise in electron concentration as Gd is replaced by Ce or Th.

Magnetic Properties of $R_{2-x}R'_xCo_{17}$ Compounds (R = Gd, Dy, Ho, or Er, R' = Th or Ce). K. S. V. L. Narasimhan and W. E. Wallace. Department of Chemistry, University of Pittsburgh, Pittsburgh, Pennsylvania 15260. Magnetic and structural characteristics of the ternary systems $Ln_{2-x}Th_xCo_{17}$ (Ln = Gd, Dy, Ho, and Er) and $Ln_{2-x}Ce_xCo_{17}$ (Ln = Gd, Ly, and Ho) are presented. Incorporation of Th in the lattice stabilizes the Th_2Zn_{17} structure, whereas incorporation of Ce does not; if the binary system has the Th_2Ni_{17} structure the incorporation of Ce leaves the structure unchanged. The antiferromagnetic Ln–Co coupling observed in the Ln_2Co_{17} systems persists in the ternary alloys. The moment of the cobalt sublattice is decreased when more than half of the Ln is replaced by Th, suggesting that the extra electron contributed by Th enters the Co *d*-band or *d*-shell. The direction of easy magnetization is in the basal plane for all composition in the Gd, Dy, and Ho systems. In $Er_{2-x}Th_xCo_{17}$ the easy direction is along the *c*-axis for $x = 0$ and .2 but is in the basal plane for higher thorium contents.

Analyse des Profils de Raies de Diffraction des Rayons X d'un Hydroxynitrate de Nickel Non Stoechiometrique. D. Louër. Faculté des Sciences, Laboratoire de Cristallochimie, Avenue du Général Leclerc, 35031 Rennes Cédex, France. A microcrystalline nonstoichiometric nickel hydroxynitrate $Ni(OH)_{1+s}(NO_3)_{1-s}$ ($0.288 \leqslant s \leqslant 0.452$) is studied by Fourier X-ray line profile analysis. Corrections for instrumental broadening are performed by LWL deconvolution method. The application of the Houska and Warren's method, modified by Maire and Méring, indicates that the line broadening of 001 reflections is not only due to a small particle size effect, but also to crystal defects involving variable interlayer spacings. Seven samples with different s values are investigated. The results indicate that the crystallites of all specimens are composed of a similar number of layers. The mean squares of the variation of the interlayer spacings range from 0.0148 to 0.0003. The square roots are inversely proportional to the s parameter. It is believed that the observed distortions arise from an irregular distribution of nitrate ions from one layer to another. As s increases, a progressive regularization of the number of nitrate ions involved in each layer is assumed. Existence proof of a well-crystallized nickel hydroxynitrate $Ni_2(OH)_3(NO_3)$ results from this study.