11.8-06 MULTIPLE DIFFRACTION IN GARNETS.
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Renninger effect was studied in different crystals of garnets (AYG, GGG). It is shown that space group of investigated garnets is Ia3d not R$\bar{3}$ as previously reported (J.Chenavas et al., Journal of the Less-Common Metals 62, 373 (1978)). Appearance of the forbidden (200) and (222) reflections as J.Chenavas et al. pointed out is explained by disregard of Umweganregung peaks rise. Regularities of many-beam diffraction in garnets are discussed.

11.8-07 X-RAY DIFFRACTION FROM FCC CRYSTALS CONTAINING A NON-RANDOM DISTRIBUTION OF DEFORMATION FAULTS.
By S. Lele, Department of Metallurgical Engineering, Banaras Hindu University, Varanasi 221005, India, and Dhananjai Pandey, School of Materials Science & Technology, Banaras Hindu University, Varanasi 221005, India.

In developing the theory of X-ray diffraction from faulted fcc crystals it is normally assumed that the faults are distributed entirely at random. This assumption breaks down in crystals undergoing the fcc to hcp transformation since the transformation is believed to occur through a non-random insertion of deformation faults on alternate 111 planes. The purpose of the present investigation is to develop the theory of X-ray diffraction for such crystals. For this, we have assumed that once a fault has occurred on a particular layer, it will not occur again on the very next layer. Using this model we have performed a detailed mathematical calculation to obtain an exact expression for the diffracted intensity and to predict theoretically the observable diffraction effects such as change in the intensity, broadening and the shift in the peak positions of different reflections with $h-k \neq 0 \bmod 3$. A comparison of the theoretically predicted diffraction effects with those actually observed can enable one to establish the mechanism of transformation in materials like Co and its alloys.

11.9-01 DETERMINATION OF THE ANION POSITION PARAMETER IN MnF_2 FROM γ-RAY DIFFRACTION.
By W. Jauch and J.R. Schneider, Hahn-Meitner-Institut für Kernforschung, Berlin, FRG

γ-radiation ($\lambda = 0.0301$ Å) was used to collect selected Bragg diffraction intensities on an absolute scale from a single crystal plate of rutile-type MnF_2. The objective was to detect whether there is a magnetostrictive change in the positional parameter u. The reflections were chosen for maximum sensitivity with respect to this parameter. Each reflection was measured repeatedly in order to test for multiple scattering and inhomogeneities in the mosaic structure.

Structure refinement with anisotropic temperature factors, based on 25 observations of average precision $\overline{\sigma(F_o)/F_o} = 0.004$, yielded at room-temperature: $u = 0.30530(7)$; $\sum w(F_o-F_c)^2/(25-8) = 1.05$. The weights were derived from counting statistics alone. No extinction correction has been applied.

The result of diffraction measurements below the Néel-Temperature ($T_N = 67$ K) will be reported.

11.9-02 THEORY OF MÖSSBAUER DIFFRACTION IN MOSAIC CRYSTALS.
By E.V.Smirnov & V.A.Belyakov, All-Union Research Institute of Physical-Technical & Radiotechnical Measurements, Moscow, U.S.S.R.

The theoretical investigation of Mössbauer gamma-ray diffraction in mosaic magnetically-ordered crystals based on the transport equations is presented. The equations have the following form

$$\gamma_1 \frac{d\hat{J}_1}{dz} = (\hat{A}_1 - \hat{B}_1)\hat{J}_1 + \hat{C}_{12}\hat{J}_2$$
$$\gamma_2 \frac{d\hat{J}_2}{dz} = (\hat{A}_2 - \hat{B}_2)\hat{J}_2 + \hat{C}_{21}\hat{J}_1 \qquad \text{(I)}$$

where $\hat{J}_1$ and $\hat{J}_2$ are the polarization tensors of direct and diffracted beams, $J_p^{ik} = E_p^i E_p^{k*}$, E_p, γ_p are amplitudes and direction cosines of the waves respectively, indexes $i,k = 1,2$ label polarization of the waves, $\hat{A}$, $\hat{B}$, $\hat{C}$ are the matrix operators with elements depending on the structure amplitude $F_{\ell m}^{ik}$. In the limit of the nuclear resonant scattering amplitudes equal to zero the system (I) coincides with the corresponding system for X-ray diffraction (Dmitrienko & Belyakov, Acta Cryst. (1980) A36, 1044).

It is shown that the system (I) describes the dependence of intensity and polarization characteristics of diffracted beams and in particular their depolarization, on details of mosaic structure of crystal.

Two cases in which the system (I) has an