Atomic Ordering and Lattice Distortion in the Zirconium-Oxygen Alloys with 28.2 and 29.2 at.% Oxygen(Physics)

atomic disorder. The composition dependence of the residual resistivity also seems to be explainable from this point of view.

Slip Patterns of Copper Whiskers Subjected to Tensile Deformation

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Phys. Stat. Sol. (a), **24** (1974), 305.

Slip patterns of copper whiskers with [001], [011], and [111] orientations subjected to tensile deformation have been observed with a differential interference-contrast microscope. In some whiskers, a slip line appears below or just below the yield stress and its step height increases with increasing strain. The yield drop occurs when the slip line is crossed by another slip line newly formed and the Lüders band propagates from this crossing place. At the front of the Lüders band, slip lines due to cross slips or double cross slips are observed. This fact means that the Lüders band propagates by cross slip or double cross slip mechanisms.

An X-Ray Diffraction Study of Atomic Ordering in Platinum-Rich Copper-Platinum Alloys

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Trans. Japan Inst. Metals, **14** (1973), 309.

Atomic ordering in the copper-platinum alloy system has been studied by X-ray diffraction using single crystals with compositions of Cu–48, 54, 61, 66 and 70 at% Pt. At the composition near the equiatomic one, an ordered structure CuPt, first found by Johansson and Linde, has been confirmed. A negative result has been obtained for the existence of an ordered structure Cu_3Pt_5, which was proposed by Linde. An ordered structure formed at the composition near $CuPt_3$ has been shown to be consistent with the structure model of Tang rather than that of Schneider and Esch.

Atomic Ordering and Lattice Distortion in the Zirconium-Oxygen Alloys with 28.2 and 29.2 at.% Oxygen

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J. Appl. Crystallography, **7** (1974), 67.

The structure of the interstitially ordered lattice formed in zirconium-oxygen alloys has been studied with use of single-crystal data obtained by X-ray and neutron diffraction methods. The structure belongs to space group $P312$ and the lattice parameters a and c are related to a_0 and c_0 of the host hexagonal metal lattice by $a=\sqrt{3}a_0$ and $c=c_0$. The ordered arrangement of interstitial oxygen atoms is described as a regular stacking of layers parallel to the (00.1) plane with the sequence $(AC)B(AC)B\ldots$, which is of the same type as that of nitrogen atoms in ε-Fe_2N. The occupancy probability of oxygen atoms is high for interstitial sites of the A and B types while it is low for sites of the C type. The host metal lattice

is distorted in such a way that spacings of successive (00.2) planes are not the same and a hexagonal network of atoms in these planes is periodically deformed.

Correlative Microdomain Model for Short-Range Ordered Alloy Structures. I. Diffraction Theory

Shinya HASHIMOTO

Acta Crystallographica, **A30** (1974), 792.

A diffraction theory is developed for diffuse scattering from disordered binary alloys with short-range order. It is based on a model of ordered microdomains embedded in a disordered matrix and interference effects between the domains are considered. There is a possibility that the fine structures of diffuse scattering as observed in the cases of Cu_3Au, CuAu and Cu_3Pd alloys result from the introduction of interdomain correlations. From experimental diffuse intensity values one can calculate the statistical distribution of microdomains in antiphase with one another.

Effect of Pressure on the Ordered Structure and Phase Transition of the CuAu Alloy

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J. Phys. Soc. Japan, **36** (1974), 1037.

Effect of pressure on the CuAu alloy having a long period ordered structure has been studied using mainly a tetrahedral-anvil type press. The alloy was annealed at various temperatures ranging from 350°C to 500°C during application of pressure. After temperature and pressure were reduced to ambient ones, the structure formed in the alloy during compression and retained to atmospheric pressure was studied by a usual X-ray diffraction method. The maximum pressure applied was 70 kbar. It has been observed that pressure increases the order-disorder transition temperature at an initial rate of 1.5 ± 0.2 deg/kbar. The long period of the CuAuII structure formed under compression has been observed to increase with increasing pressure. Under the pressure higher than 50 kbar the CuAuII structure becomes unstable and the only ordered structure formed is CuAuI. The results obtained are discussed by taking into account a distortion of the Fermi surface of the alloy induced by pressure.

Pressure-Induced Change in the Long-Period Stacking Sequence of the Close-Packed Layers in Mg_3In

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J. Appl. Crystallography, **7** (1974), 611.

Samples of the alloy Mg_3In were annealed at 200–250°C in the Bridgman-anvil-type press under pressures between 20 and 100 kbar. After being quenched to ambient pressure and temperature, the crystal structure was studied by X-ray diffraction. The number of close-packed layers in one repeating unit of the alloy