Magnetic Properties of Co-Fe-Ru Alloys in the f.c.c. and h.c.p. Phases(Physics)

results and those of North *et al.* has been obtained. It is concluded that the T-O-F method incorporated with a pulsed neutron source can yield reliable data for the liquid metal structure analysis which are as accurate as those obtained from a steady reactor.

Nonferromagnetic Cr-Si-Mn Invar Alloys

K. FUKAMICHI and H. SAITO

Magnetism and Magnetic Materials, 1974 (Proc. 20th AIP Conf.), 384.

To obtain nonferromagnetic Invar alloys, the physical properties of some Cr-base dilute alloys are investigated. Cr is an antiferromagnetic metal and its physical properties around the Néel temperature T_N are sensibly affected by the addition of solute atoms.

It has been found that the antiferromagnetic transition in Cr-Si alloys is of the first kind. The thermal expansion coefficients of the alloys below T_N become very small, showing the Invar characteristic; the Invar region is observed below room temperature and the region occurs at lower temperatures with increasing Si concentration. In Cr-Mn alloys, T_N increases with Mn concentration and the thermal expansion coefficients below T_N become smaller, but their T_N are far above room temperature.

Taking these results into consideration, the thermal expansivity and the magnetic properties of Cr-Si-Mn primary solid solution alloys have been measured. It was found that the alloys are antiferromagnetic showing the Invar characteristic, and the magnetic susceptibility of the alloys is very small; their magnetism is practically negligible.

The Magnetic Properties of Some Gd-Sm and Gd-Nd Alloys

H. FUJIMORI, K. GOTO and D.E.G. WILLIAMS

J. Phys. F: Metal Phys., **4** (1974), 2152.

Measurements have been made of the magnetizations of Gd-Sm and Gd-Nd alloys with Gd contents greater than about 75%. The magnetic moments of these alloys in the hcp phase can be interpreted as indicating that in these alloys the samarium atoms carry magnetic moments of $0{\cdot}9\pm0{\cdot}3\ \beta$, and the neodymium atoms carry magnetic moments of $3{\cdot}3\pm0{\cdot}1\ \beta$, and that these moments are aligned ferrimagnetically with the Gd atomic magnetic moments.

Magnetic Properties of Co-Fe-Ru Alloys in the f.c.c. and h.c.p. Phases

H. FUJIMORI and H. HIROYOSHI

Solid State Commun., **15** (1974), 1287.

Measurements have been made of the magnetization, the Fe^{57} Mössbauer effect, and the crystal structures of Co-rich Co-Fe-Ru alloys. The alloys with f.c.c. structure behave in a typical ferromagnetic way, while those with h.c.p. structure show non-saturation of the magnetization in magnetic fields as high as 80 kG, and

they show relatively small magnetic moments per atom and a broad single Mössbauer absorption.

Influence of Magnetic Fields on Sound Velocity of V_3Si

T. FUKASE, K. UEMA and Y. MUTO

Physics Letters, **49A** (1974), 129.

It is found that the velocity of longitudinal sound waves propagating along [100] of a single crystal of V_3Si increases quadratically with magnetic field and the relative change $\Delta v/vH^2$ by magnetic field has a maximum value at 35 K.

Thermal Conductivity of Ta-Nb Alloys in Superconducting, Mixed, and Normal States

Norio KOBAYASHI, Koshichi NOTO, Manabu IKEBE, and Yoshio MUTO

J. Low Temp. Phys., **17** (1974), 575.

The thermal conductivity of the type II superconductors $Ta_{95}Nb_5$, $Ta_{80}Nb_{20}$, $Ta_{60}Nb_{40}$, and $Ta_{20}Nb_{80}$ has been measured as a function of magnetic field up to 14 kOe and of temperature between 0.5 and 4.5 K. The temperature dependence of the thermal conductivity in the superconducting state is well accounted for on the basis of the Bardeen, Rickayzen, and Tewordt theory above $0.4T_c$. The lattice thermal conductivity limited by dislocation scattering is observed below $0.3T_c$. The thermal conductivity near the upper critical field H_{c2} shows a linear dependence on magnetic field as predicted theoretically by Caroli and Cyrot. After the correction of the phonon contribution, the experimental results for the dirtiest sample, $Ta_{60}Nb_{40}$, are found in good quantitative agreement with the theory. Deviations from the theory for less dirty alloys depend on the electron mean free path.

A Rotating Crystal Time of Flight Spectrometer Using a Pulsed Neutron Source

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Canad. J. Phys., **52** (1974), 2093.

The design and construction of a rotating crystal spectrometer for use with a pulsed neutron source is described. The source is the tungsten target of a 33 MeV electron linear accelerator, and at 5 kV mean power the spectrometer performance is equivalent to that of a similar instrument mounted on a nuclear reactor of 4×10^{12} n/cm^2 s flux. Future developments will give an order of magnitude overall improvement. This spectrometer has been shown to be useful for studies of dense gases and liquids using an incident neutron wavelength of 2.4Å, and its performance at wavelengths between 0.5 and 6.2Å has been assessed.