05.1–27 THE EFFECT OF COOLING RATE ON α-PHASE ORDERING IN Cu-25at.%Al ALLOY. By Z.Bojarski, J.Lelątko, J.Kwarciak and H.Morawiec, Institute of Physics and Chemistry of Metals, Silesian University, Katowice, Poland

The presence of α_2 or α_3-superstructure was studied by electron microscopy on samples consisting of $\alpha+\gamma_2$ eutectoid cooled from 500°C to 25°C at a rate from 25°C/min. to 0.2°C/min.

The D-parameter which determinates the position of the superstructure spots in the reciprocal lattice was used to describe the kind of superstructure. With decrease in cooling rate the D-parameter increases. The value of D=0.357=5/14 was obtained for α_3-phase at a higher cooling rate and D=0.375=3/8 corresponds to the α_2-phase at the lowest cooling rate. With decrease of cooling rate an increase of ordered α_2-regions was observed in the dark field image.

The ordering of α-phase was also studied for isothermal annealing at 240°C and 300°C for 300 hours. The lower annealing temperature formed the α_3-superstructure whereas annealing at 300°C - the α_2-superstructure.

The studies of the ordering process was carried out by measuring the heat of the thermal effect by DTA and DSC methods. The magnitude of the thermal effect during heating of the ordered samples was dependent on the degree of α-phase order. A correlation was stated between the D-parameter and the heat absorbed due to disappearance of order in the α_2-superstructure while heating.

05.1–28 INVESTIGATION OF THE X-RAY WAVE-LENGTH DEPENDENCE OF A CRITICAL DIFFRACTION EFFECT AT THE PHASE TRANSITION OF V_3O_5. By S. Åsbrink, Department of Structural Chemistry, Arrhenius Laboratory, University of Stockholm, S-106 91 Stockholm, Sweden, L. Gerward, Laboratory of Applied Physics III, Technical University of Denmark, DK-2800 Lyngby, Denmark and J. Staun Olsen, Physics Laboratory II, H.C. Ørsted Institute, University of Copenhagen, DK-2100 Copenhagen, Denmark.

In a previous X-ray single crystal diffraction investigation of the phase transition in V_3O_5, an instantaneous strong increase in peak intensity together with a peak broadening was observed for the strong reflexions at the phase transition temperature 155°C, MoKα-radiation being used (Åsbrink and Hong, Nature (1979) 279, 624). In subsequent measurements using a diffractometer of Bond type (Łukaszewicz, Kucharczyk, Malinowski and Pietraszko, Krist. und Techn. (1978) 13, 561), the observations were repeated with MoKα-radiation; however, no such effects could be seen using CuKα-radiation (Åsbrink, Wołcyrz and Hong, Phys. Stat. Sol., to be published). The present investigation was undertaken in order to study the wave-length dependence in greater detail, using a spectrometer for energy dispersive diffraction (Staun Olsen, Buras, Gerward and Steenstrup, J. Phys. E: Scient. Instrum. (1981) 14, 1154). The paper discusses the experimental results in relation to several possible interpretations of the effect.

05.1–29 STRESS-INDUCED ELECTROGYRATION AND GYROTROPIC PHASE TRANSITIONS IN ALUMS. By H.-J. Weber, Institut für Physik der Universität Dortmund, D-4600 Dortmund, FRG

We have performed the first measurements of stress-induced electrogyration in crystals. In methylammonium aluminium alum (MASD) most of the impact of externally applied pressure p on electrogyration ($\delta\rho/\delta E$) can be traced back to an interference of induced birefringence with induced optical rotation. Nevertheless it is possible to work out another intrinsic effect which is described by $\delta^2\rho/\delta E\delta p$. It has a value of 10^{-17} deg·m^3/V·N, changes its sign at about 210 K and increases drastically near the phase transition at 177 K.

Furthermore we have measured the effect in chromium-doped MASD-crystals and in hydrazine- and ammonium- aluminium alums. The results show that the phase transitions in different alums are similar in respect to their gyrotropic character although they differ in their ferroelectric behaviour.

05.1–30 ON THE SYSTEMATIZATION OF CONTINUOUS TRANSFORMATIONS FOR STRUCTURAL TYPES. D.M.Mazo, Institute of Solid State Physics, Academy of Science of the USSR, Chernogolovka. Among different structural types that falls into the given space group part is not capable to continuous transformations (T) due to the change of the scalar external parameter, the others can undergo these T by one or several ways. Within the limits of a given space group structural types differ from one another by the number and (or) kinds of regular systems of points (RSP) occupied by elements of structure. For cubic structures number of different RSPs comes to 154, among which the 55 are met in different space groups and rest are unique. Six space groups ($P2_13$,$I2_13$,$P4_332$,$P4_132$,$I4_132$,$I\bar{4}3d$) contain exceptionally unique RSPs. The number of dissimilar regular systems of points related to one site of Bravais lattice (RSPB) reduces to 127 among which the 69 are unique. Only the space group $I\bar{4}3d$ is described by exceptionally unique RSPBs. Crystall-geometrical analysis of topological relations between RSPs(RSPBs) make it possible to reveal all the Ts for all structural types and find the symmetry of external parameter assisting the given transformation of the RSP (within a given crystal symmetry class or between classes) and illustrate possible mechanisms of transformations. The present paper describes the Ts that are within the limits of cubic structures due to the change of a scalar external parameter and correspond to the following topological relations: (1) an RSP comprises several RSPs, (2) two RSPs coincide at certain values of free parameters in the points coordinates, and (1+2). It is found that the Ts by type (1) can occur in structures in which,in particular, the occupied RSPs have the multipli-