24.1-01 ORDERING OF THE $Pd_{60}Cu_{40}$ ALLOY METALLIC LATTICE AT HYDROGENATION. V.F.Degtyareva, V.E.Antonov, I.T.Belash, E.G.Ponyatovsky. Institute of Solid State Physics, USSR Academy of Sciences, 142432, Chernogolovka, USSR

The electrical resistance of the $Pd_{60}Cu_{40}$ alloy hydrogenized at $P \leqslant 20$ kbar and $T=200^{\circ}C$ increases during ~50 min, then it remains almost unchanged. Exposure of the sample at $T > 200^{\circ}C$ decreases the electrical resistance irreversibly, that is the evidence of the non-reversible phase transition. An X-ray study of the hydrogenated samples was made after cooling and subsequent releasing the pressure to atmospheric. For the samples hydrogenized at $T=200^{\circ}C$ the metallic lattice had a f.c.c. structure with $a=3,897 \pm 0,005$ Å (at $-190^{\circ}C$). This phase should be considered as a hydrogen solid solution on the base of initial f.c.c. lattice of alloy. Samples hydrogenized at $T \geqslant 200^{\circ}C$ had the metal sublattice, which may by described on the base of a face centered tetragonal pseudo-cell with parameters $a=3,958 \pm 0,08$; $c=3,828 \pm 0,012$Å; $c/a=0,967$ (at $-190^{\circ}C$). The hydrogen content in both cases was $n \lesssim 0,5$. At the hydrogen release from the samples after annealing at 300°C, their metal sublattice retained its tetragonal distortion, the degree of tetragonality even increased . These seem to be favourable for the assumption that the observed tetragonal distortions are due to the atomic ordering of the metal sublattice itself occuring in the $Pd_{60}Cu_{40}$-H solution. This assumption is supported by appearance of superstructural diffraction lines in addition to the basis ones.

24.1-02 THE CRYSTAL CHEMISTRY OF DOUBLE SYSTEMS OF VANADATE PYROXENES $M^{+}VO_3$ (M=Li,Na, K,Rb,Cs). R.S.Bubnova, S.K.Filatov, V.S.Grunin, Z.N.Zonn, I.V.Roshdestvenskaya, Institute of silicate chemistry, USSR Academy of Sciences, Leningrad, USSR.

In the $Na_XLi_{2-X}V_2O_6$ system of clinopyroxenes rare continuous isomorphism for Li-Na has been found in the range room-melting point temperatures. The crystal structures of members with X=0.15, 0.66, 1.00 (Буóнова et al, Кристаллография , (1980) 25, 1287), 1,40 and 2.00 have been determined. The space group is C2/c, diopside structural type. In particular:

	X=0.15, R=0.039			X=0.66, R=0.036		
	$x \cdot 10^5$	$y \cdot 10^5$	$z \cdot 10^5$	$x \cdot 10^5$	$y \cdot 10^5$	$z \cdot 10^5$
V	28854	09452	26441	28914	09277	25211
M1	50000	41957	25000	50000	41683	25000
M2	50000	21426	75000	50000	20812	75000
O1	11522	10951	16420	11637	09790	15259
O2	35469	27029	28328	35218	26342	29165
O3	35505	-02561	07009	35617	-00602	04607

In the structure of $NaVO_3$ the Li atoms substitute at first the Na atoms in M1-octahedra up to $LiNaV_2O_6$, and then in M2-octahedra up to $LiVO_3$. The temperature deformations of monoclinic crystals of that series are highly anisotropic. The largest α_2 axis of the deformation tensor is oriented along b-axis, the smallest (negative) α_1 axis is placed near the acute bisectrix of β angle of monoclinity. The degree of $(\alpha_3 - \alpha_1)$ anisotropy of monoclinic ac plane correlates with the speed of β angle change, and decreases with increasing temperature and during the transition from the end members of series to the middle ones.

In the $NaVO_3$(clinopyroxen) - KVO_3(orthopyroxen) system, when $Na/K \geqslant 1$, the isomorphism appears near the end members of series at room temperature and becomes unlimited at 400-450°C. The isomorphism is limited when $Na/K < 1$.

In the orthopyroxen KVO_3-$RbVO_3$ system continuous isomorphism is accompanied by almost linear changes of cell dimensions. In the KVO_3-$CsVO_3$ system isomorphism is limited by intervals 0-10 and ~90-100 mol.% in system KVO_3-$CsVO_3$.

24.1-03 INFLUENCE OF OPTICAL PUMPING ON FERROELECTRIC PHASE TRANSITION IN PROUSTITE Ag_3AsS_3. I.M.Shmytko, V.Sh.Shekhtman, V.I. Ivanov, Institute of Solid State Physics, the USSR Academy of Sciences, Chernogolovka, Moscow district, 142432, USSR.

Influence of optical pumping on a ferroelectric phase transition of the first order has been investigated in Ag_3AsS_3 at 28K by the method of low-temperature diffractometry. Optical pumping was realized from a highpressure xenon lamp. Temperature hysteresis reduced markedly at 10^5 lx and practically vanished at 10^6 lx. If the optical pumping is kept constant at $1-1,5 \cdot 10^6$ lx there appears an interval $\Delta T \sim 1$K where the self-oscillating regime of the phase transition, i.e. para-ferro-para state ($R3m \leftrightarrow PI$) takes place. Period of oscillation recorded diffractometrically by the reflection intensity of one such phase is 1,5 sec. The effect was observed when the integral power of illumination was high and it vanished when the spectral composition of the incident light lay within the energy gap ($\lambda \simeq 0,6$ mkm). Within the framework of the phenomenological theory of the local field equations, the observed instability of the phase state is related to the appearance in the crystal of a constant electric field due to the optical detection. The employment of an intermittent light involved a drop in the intensity from which the self-oscillations began. At low frequences of the light pulsations the self-oscillations were periodically recurrent in the nature, i.e. the crystal passed over one of the stable (para