

SYMMETRY CHANGING AND PHASE TRANSITIONS IN THE PLANE STRUCTURES AS AN EFFECT OF THEIR ELEMENTS FREEDOM'S DEGREE CHANGING

Dmitry M.Mazo

Russia, 121352, Moscow, Slavyansky boulevard, 3-179

Any structure within equilibrium area is capable to suffer reversible transformation with unceasing and monotonous changing of any internal parameters in connection with the external conditions unceasing and monotonous changing. Conservation of other internal parameter's group which form the structure identifier and select it from the other structures of given ensemble, ensures the structure individuality conservation (these parameters may be change by discrete manner only). The transition means a conservation of a changed structure parameter's lists and types with further external parameters changing so as after turning their change signs.

Phase transitions are possible to consider as a position changing in the VCP-space, where V - independent freedom's degrees (variables) number, C different restrictions (constants) number and P (V- and C-independent number, the Wykoff's position (WP) multiplicity for example). Main advantage of approach is a possibility of its expansion on structures of any nature (for instance, to the chess party, as the starting structure destroy and new structure creating a process of with certain characteristics) in view of invariance of their description in the VCP-space and possibility of connection between symmetry changing direction and the external parameters changing direction. The transition sequence and their Landau kind is defined by the mutual ((vicinity) structures $dR_{v,,} = ((1 dV + dC 1 + 1 dP dV + 1 dC 1 + 1 dP 1))/2$) or by the single steps number between the cells in VCP-space. Principle of least action allows produce the possible unceasing transition variants selection:

1. result, or value $1 dR \quad dV$ must be equal to an action $1 dV 1;,-0$,
2. values not fall into identifiers fixed parameters must save their values before and after transformations,
3. uniform free parameters must don't split, accepting simultaneously different fixed values or moving over to the different lists - free and fixed (and contrary) as a transformation result.

VC projection of plane lattices VCP- space (*abv*) is presented by the table 1.

Account of coordinates of spots WP structures increases a parameter list, volume VCP-space and number of structures in some its cells. For WP ((general provisions)) (*xy*) flat groups of symmetry it has the form of table 2 (here groups are mark by it's IT numbers on four levels $P=1-1-4$).

Table 3 presents all possible transition between flat structures ((general provisions)) WP, caused by: *a*, *b*, *v* lattice deformation (*d*), *xy* change (*x*), order - disorder (*o*) structure elements distribution on WPs, accompany by changing of additional order parameter *A*, and distances between the structures as numbers of steps *dV*, *dC*, *dP* or (*dV/dC*), *dP*.