DEPENDENCE OF THERMODYNAMIC AND KINETIC PARAMETERS OF CVD-PROCESSES FROM USING CHELATES STRUCTURE

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A linear relation from reverse temperature (1/T] of the logarithm of a specific reaction rate of precipitation, dividing all intervals of temperatures on three kinetic areas characterizes CVD of coordination compounds of metals. Each of these three areas is characterized by value of effective critical increment of energy of a precipitation process, and entropy rate of a precipitation process, which determine parameters of the specified dependencies. The dependence of the gas phase precipitation process kinetic parameters from the quantity of heat of shaping of metal in β- diketonates and dependence last from inductive influence of the substituents in ligands of surveyed complexes is fixed.

The schema of forecasting of thermodynamic and kinetic parameters of precipitation from a gas phase in β-diketonates of metals is offered.

- The shaping of a file of propagation of substance at precipitation from a gas phase at breaking-up of coordination compounds of metals are occurs. As we already scored, in requirements of superposition of collaterally running processes of activation in the field of previous by adsorptive, adsorption - desorption, surface and volumetric responses of breaking-up, diffusion etc.. Size of area previous by adsorptive, the rates and directions of passing of processes in adsorptive area depend on a type of activation action in a method CVD. The intensity of this action also is a major factor limiting reception of matting with this or that morphology (1).

Influence of a temperature schedule on shaping of structure of function materials obtained by a method CVD, is explored fullestly. A temperature schedule - most important characteristic allowing to influence on the morphological and chemical characteristics of materials, obtained as a result of precipitation. Especially important the dimensional characteristics of interactions responsible for processes, occurring at precipitation are. It is and nano - scale processes of reception of function materials.

The assaying of the experimental activation curves of thermal decomposition of coordination compounds (in this case β-diketonates of metals] shows, that, generally speaking, it is possible to bleed three kinetic areas described by various quantities of activation energies and the particular morphology of obtained functional materials. In the first activation area greatest is the rate of breaking-up of coordination compound in bulk and for shaping materials, limiting - speed of adsorption metal holding of precursor breaking-up yields. The critical increment of process energy is close to zero, the morphology of yields is characterized small orderings, and weak adhesion.In the second kinetic are limiting there will be a process of activation adsorption. The processes in this kinetic area are characterized by high values of critical increment of energy, low speeds of propagation of yields, amorphous structure.

Essentially, from the point of view of morphology of obtained breaking-up yields, the assaying of the generalized activation curve (in case of plasma, laser, photo, radiative or other of activation] should not give other effects. At a choice of requirements of reception of quality function materials with satisfactory high-speed parameters of propagation, it is necessary to find suitable kinetic area on the activation curve.

Kinetic explorations of metal β- diketonates(4,5), by comparison them with the results of exploration of their electronic and geometrical structure, have allowed to make a deduction about the dependence of microkinetic parameters of precipitation on temperature-independents constant of inductive influence of the substituents in ligands and configuration of a valence shell of central atom.

Thus, it is necessary to fix dependence of kinetic parameters and mechanism of all processes proceeding in all making chemical deposition, from a gas phase of inner-complex compounds. It is not only viewing of each process separately, but also to have an opportunity, on a base of the assaying of streams of substance to analyze CVD as a whole.

Values of thickness near-surface of surface for various processes during a chemical deposition from a gas phase (nm)

precursor	δ_T	δ_a	δ_s
$Al(aa)_3$	8.6	1.7	1.2
$In(aa)_3$	10.2	2.1	1.1
$Zn(aa)_2$	9.5	2.5	1.1

The obtained values are extremely important for a choice of parameters CVD at designing micro - and nano- of scale technologies.

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