

Thermodynamic Properties of Liquid-Vapor Equilibrium and the Energies of Specific Intermolecular Interactions of Components of Vitamin "E" Synthesis

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In this lecture we discuss the results of a study of liquid-vapour equilibrium of the components of vitamin "E" synthesis of acetylene series alcohols $C_{15}H_{28}O$, $C_{20}H_{38}O$, isophitol ($C_{20}H_{40}O$), dihydrolinalool ($C_{10}H_{16}O$ -3.7-dimethyloctaen-6-in-1-ol-3). The investigations were conducted by the static method with zero-manometer at a wide range of pressure, temperature by the calorimeter of vaporization method using special clean compounds; witch ensured the determination of dependable data of thermodynamic properties. Measured were vapor pressure, the boiling points, temperature of decompositions, and thermodynamic properties of vaporization process. We established the temperature dependence of the vaporization enthalpies, and substantiated the presence of monomer forms of molecules in compounds in vapor phase. The study of isopropanol and isobutanol at saturated and unsaturated pressure made it possible to verify the thermodynamic characteristics of these compounds, to determine the constants and thermodynamic properties of the dimerization of isopropanol and to establish the co-ordination between thermodynamic properties of aliphatic series alcohols and acetone alcohols, isophitol, and dihydrolinalool. The thermodynamic properties of acetylene alcohols $C_{10}H_{16}O$ (50.72), $C_{20}H_{38}O$ (44.00), and isophitol $C_{20}H_{40}O$ (44.67 kJ.mol⁻¹) are classical example of the absurdity of the existing principles that molecular masses are determined the thermodynamic properties of the vaporization process and, secondly, that a increase of number of CH_2 -groups does not have an influence on the evaporation enthalpy.

In this lecture we analyze different kinds of specific intermolecular interactions with participation of a pentacoordinated carbon atom and hydrogen-bonding in aliphatic series and acetone alcohols, isophitol and, dihydrolinalool of the components of vitamin "E" synthesis established before participation of an essentially non-divided $2s^2(C)$ -electron pair localized on the carbon atom of methane or CH_3 -methyl groups of alkyl ligand or functional groups [1,2]. We work out novel approaches [3,4] of thermodynamic analysis and determination of the energies of specific intermolecular interactions from thermodynamic characteristics. The low governed nature of their change was determined and analyzed.

- [1] A.K. Baev, *Sixth International Symposium on Carbanion Chemistry* (Marburg, Germany, 2001) 75.
- [2] A.K. Baev and D.V. Korolkov, *XVth FEChem Conference on Organometallic Chemistry* (University of Zurich, 2003) 350.
- [3] A.K. Baev, *28th International Conference on Solution Chemistry* (Debrecen, Hungary, 2003) 79.
- [4] A.K. Baev, *IX International Conference, The Problems of Solvation and Complex Formation in Solutions* (Plyos. Russia, 2004) 62-64.