

Study of the Thermodynamic Parameters of Viscous Process in Some Mono Substituted Benzenes

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The thermodynamic parameters of relaxational processes in mono substituted benzenes have been investigated in other works [1, 2]. It was elucidated that for the studied liquids the change of molar free energy has a large value with reference to the molar enthalpy activation change. The change of the molar entropy activation has a negative sign. The results on relaxational processes presented in [1, 2] are characterized by molecular rotational motions. It is interesting to determine these thermodynamic parameters from viscous flow processes. We studied some mono substituted derivatives of benzene in the liquid state, namely: benzene, toluene, chlorenebenzene, bromobenzene, iodinebenzene and fluorinebenzene. The literature data on the dynamic viscosity coefficient for all of these liquids have not been measured over a wide temperature range. Therefore, we determined the viscosity of these liquids over a wide temperature range from temperatures up to the boiling point with a capillary viscometer. Glycerin was used at high temperatures as the thermostating liquid. For the determination of liquid densities, the floatation method was used.

Obtained results show that the thermodynamic parameters of viscous processes have close values to those for rotation relaxational processes and close values to those for rotation relaxational process and the change of activation molar entropy as well as in the case of orientational relaxation that has a negative sign. Therefore, for viscous flow process the translational motion of the molecules is accompanied by rotational motion. Activated states of the molecules at viscous flow are more ordered than at the normal state.

- [1] L.I. Imanov and K.E. Zulfugurzade, *Uzv.AN. Azerb. SSR* **5**, 6 (1962).
- [2] S.A Abdurakhmanova Abstracts 15th symposium; p. 76 (2003) (The study of relaxational processes: thermodynamics parameters by light scattering method in some organic compounds of aromatic row and its solutions.)