

Thematic course: The influence of the medium on reactivity. Part 22.

Activation of the motion of the molecules of reagents in the liquid phase

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Abstract

The forms of molecules motion in the gas and liquid phases are considered. The forms of motion of molecules and the conditions for obtaining the energy from the medium which necessary for passage of a potential barrier during a chemical reaction are compared. Comparative data on the kinetics of the reaction of diene synthesis, under the conditions of a thermally initiated reaction and initiation by microwave radiation in a series of aromatic solvents for anthracene and 9-methylantracene with maleic anhydride, as well as indanocyclone with styrene are given. It is shown that in the case of a thermally initiated reaction, the reactivity of the addends varies simbacktically with the ionization potential of the solvent molecules. In the case of initiation by microwave radiation, the reactivity of the addends varies sympathetically with the dipole moment of the solvent molecules and the polarity of the addends. The obtained results correspond to the concept of the mechanism of energy transfer to the pre-reaction complex for reactions in the liquid phase by collision of a complex of reagents with solvate solvent molecules.

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