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Solvent Influence on the Diels-Alder Reaction Rates of 9-(Hydroxymethyl)anthracene and 9,10-Bis(hydroxymethyl)anthracene with Two Maleimides

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Abstract

© 2016 Wiley Periodicals, Inc. The rates of the Diels–Alder reaction of 9-(hydroxymethyl)anthracene and 9,10-bis(hydroxymethyl)anthracene with maleic anhydride and two maleimides, N-ethyl- and N-phenylmaleimide, have been studied at various temperatures and pressures in different solvent media. A rate acceleration in water in comparison with organic solvents is observed. Thermodynamic functions of activation for the reaction of 9,10-bis(hydroxymethyl)anthracene with N-ethylmaleimide in binary 1,4-dioxane–water mixtures are determined. From the observed tendencies, it can be concluded that acceleration of the Diels–Alder reactions in water is linked with an energetically favorable dehydration of the reaction centers of the reactants on the way to the activated complex. Addition of an organic cosolvent makes the desolvation of these centers less favorable.

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