Enzyme-Catalyzed Decomposition of Dibenzoyl Peroxide in Organic Solvents

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Catalytic activity of catalase (CAT, EC 1.11.1.6), immobilized on carbon black NORIT and soot PM-100, with respect to decomposition of dibenzoyl peroxide (BPO) in non-aqueous media (acetonitrile and tetrachloromethane), was investigated with a quantitative UV-spectrophotometrical approach. Progress of the above reaction was controlled by selected kinetic parameters: the apparent Michaelis constant (K_m^{app}), the specific rate constant (k_{sp}), the activation energy (E_a), the maximum reaction rate (V_{max}), and the Arrhenius' pre-exponential factor (Z_0). Conclusions on the tentative mechanism of the catalytic process observed were drawn from the calculated values of the Gibbs energy of activation (ΔG^*), the enthalpy of activation (ΔH^*), and entropy of activation (ΔS^*).