Enzyme-Catalyzed Decomposition of Dibenzoyl Peroxide in Organic Solvents

Elena Horozova*, Nina Dimcheva and Zinaida Jordanova

Department of Physical Chemistry, University of Plovdiv, 24 Tsar Assen St., Plovdiv – 4000, Bulgaria. Fax: (+359 32) 635 049. E-mail: horozova@argon.acad.bg

* Author for correspondence and reprint requests

Z. Naturforsch. 56c, 553–558 (2001); received January 25/March 12, 2001

Immobilized Catalase, Aprotic Solvents, Catalytic Activity

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 ($\Delta G^*$), the enthalpy of activation ($\Delta H^*$), and entropy of activation ($\Delta S^*$).