Electronic Supplementary Information

The rates of chemical reactions being affected by surfactants are mainly due to localization/compartmentalization, pre-orientational, polarity and counter ion effects. The exact reaction site cannot be proposed because the micellar pseudo-phase is regarded as a microenvironment having varying degrees of water activity, polarity and hydrophobicity. Previous investigations[1-5] have shown that the nature of the aggregative stability of hydrophobic sols changes fundamentally in the presence of nonionic surface active agents. The nonionic surfactant molecules, adsorbed on the colloidal particles and oriented with their polar groups towards the aqueous solution, cause hydrophilization of the particle surface and enhance the dispersion stability[6]. The activity of water at the surface is not different from water activity in the aqueous pseudo-phase. Therefore, at present, the localization of MnO_2 and histidine can be considered. Three important factors, namely, electrostatic, hydrophobic and hydrogen bonding seem to play an important role in bringing the reactants (MnO_2 and histidine) together. As far as the role of nonionic TX-100 is concerned, any type of electrostatic interaction is not possible. Also, MnO_2 and histidine have no hydrophobicity. Thus, only one factor, namely hydrogen bonding, is left for the catalytic role of TX-100. To explain this catalytic effect of non-ionic surfactant TX-100, Tuncay et al. proposed a mathematic model according to which double logarithmic plot of rate constants and concentrations of the surfactant should be linear

$$\log k_{\Psi} = x\log\left[TX-100\right] - y$$ (where x and y are empirical constants)

Therefore, above model was applied to our system and found that it is completely follow the Tuncay model as shown in Fig. 6 (inset a) with slope x = 0.1833 and intercept y = 2.7223 (r = 0.99729).

If a system is unable to fit in this model it can be point out that only hydrogen bonding factor are not accountable for the catalytic effect of TX-100 but also some other factor.

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