

## Supplementary

### An efficient mixed micellar strategy for the catalytic oxidation of benzyl alcohol by doperiodatoargentate(III) in aqueous media

Priya Karmakar<sup>a</sup>, Sandip Kundu<sup>a</sup>, Mousumi Layek<sup>a</sup>, Kripasindhu Karmakar<sup>a</sup>, Mandira Mitra<sup>a</sup>, Arnab Mukherjee<sup>b</sup>, Debasis Dhak<sup>b</sup>, Ujjwal Mandal<sup>a,\*</sup>, Pintu Sar<sup>a,\*</sup>, Bidyut Saha<sup>a,\*</sup>

<sup>a</sup>Surfactant Chemistry Laboratory, Department of Chemistry, The University of Burdwan, Burdwan-713104, West Bengal, India

<sup>b</sup>Department of Chemistry, Sidho-Kanho-Birsha University, Purulia-723104, West Bengal, India

\*Corresponding authors

Email addresses: [umandal@chem.buruniv.ac.in](mailto:umandal@chem.buruniv.ac.in) (UM), [pintusar1@gmail.com](mailto:pintusar1@gmail.com) (PS), [b\\_saha31@redifmail.com](mailto:b_saha31@redifmail.com) (BS), [bsaha@chem.buruniv.ac.in](mailto:bsaha@chem.buruniv.ac.in) (BS)

## Content

Figure no.	Figure caption	Page no.
Figure S1	The FT-IR spectrum of phenylhydrazone derivative of benzaldehyde.	2
Figure S2	The <sup>1</sup> H NMR spectrum of isolated oxidized product (benzaldehyde).	3
Figure S3	CMC determination of CPC and Brij-35 surfactants by conductometric and fluorometric plots.	4
Figure S4	The integrated <sup>1</sup> H NMR spectrum of CPC/Brij-35 binary surfactants in D <sub>2</sub> O solvent	5
Figure S5	UV-Vis spectra of DPA in presence of surfactants only.	6
Figure S6	Sequential scanned absorption spectra of DPA directed oxidation of benzyl alcohol in aqueous media at with varying Brij-35 surfactant concentration.	7
Figure S7	Sequential scanned absorption spectra of DPA directed oxidation of benzyl alcohol in aqueous media at with varying CPC concentration.	8
Figure S8	The representative plots for the studied oxidation kinetics in presence of mixed micelle.	9
Figure S9	<sup>1</sup> H NMR spectrum of benzyl alcohol itself and mixed surfactants with benzyl alcohol.	10
Figure S10	The size of various micellar nanoaggregates.	11
Table S1	Chemical shift values of CPC, Brij-35, and mixture of CPC and Brij-35	12

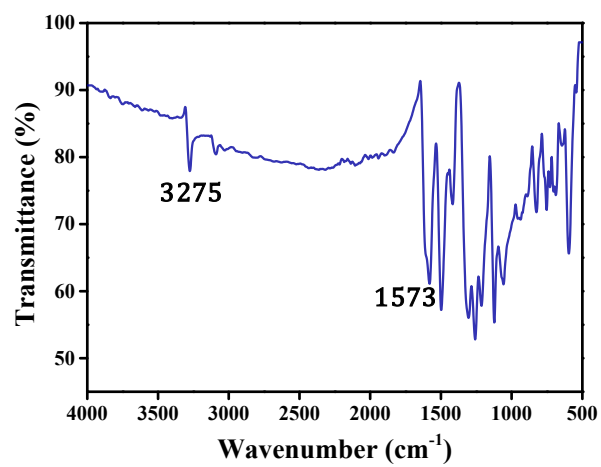


Figure S1. The FT-IR spectrum of phenylhydrazone derivative of isolated oxidized product.

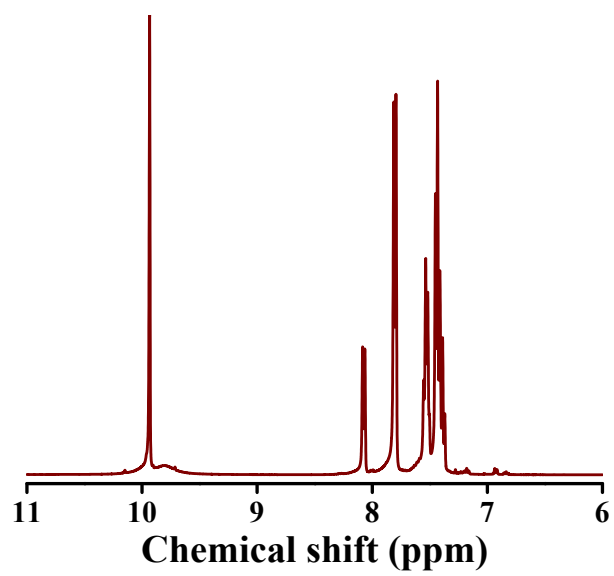


Figure S2.  $^1\text{H}$  NMR spectrum of isolated oxidized product.

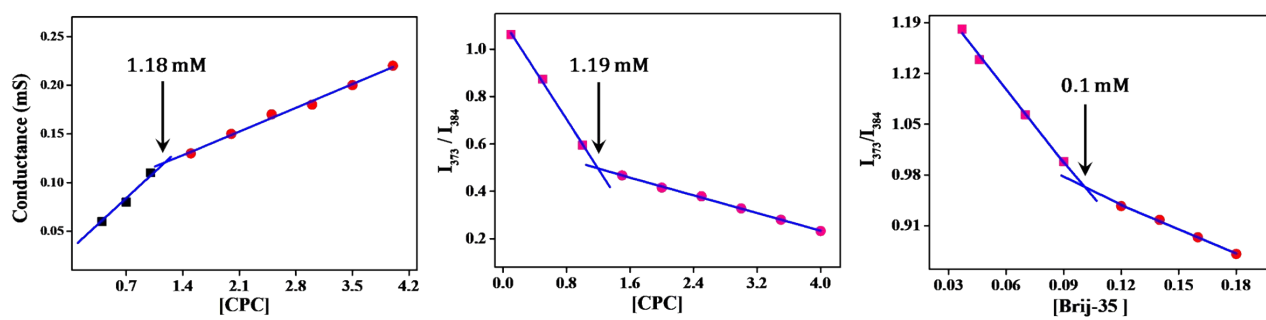


Figure S3: The conductometric and fluorometric plots of CMC determination of CPC and Brij-35 surfactants.

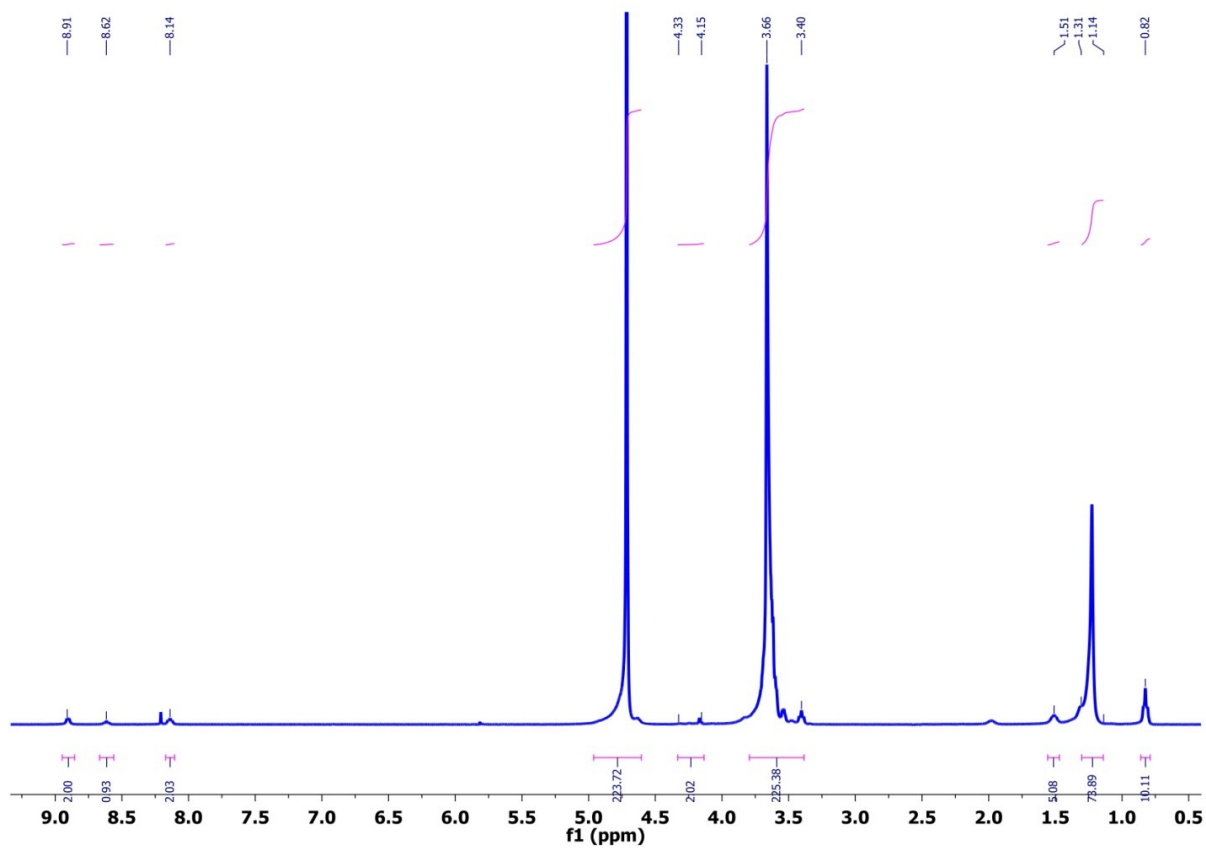


Figure S4. The integrated  $^1\text{H}$  NMR spectrum of CPC/Brij-35 binary surfactants in  $\text{D}_2\text{O}$  solvent.

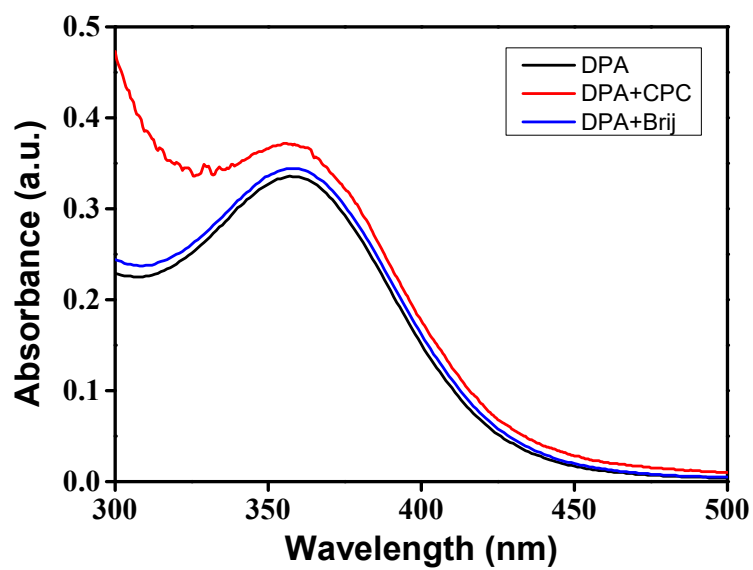


Figure S5. UV-Vis spectra of DPA [ $2.72 \times 10^{-2}$  mM] alone and in presence of studied surfactants CPC [1 mM], and Brij-35 [1 mM].

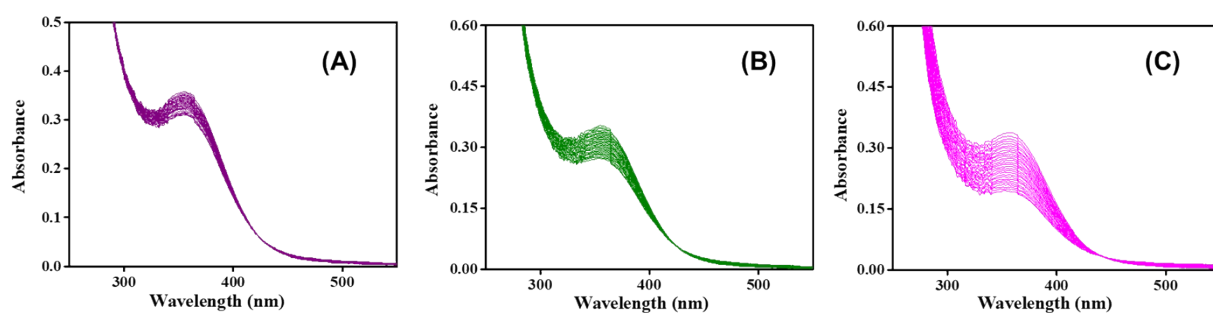


Figure S6. Sequential scanned absorption spectra of DPA directed oxidation of benzyl alcohol in aqueous media at 3 min interval in presence of 1 mM Brij-35 (A), 2 mM Brij-35 (B), and 3 mM Brij-35 (C). Condition: [benzyl alcohol] =  $2.72 \times 10^{-1}$  mM, [DPA] =  $2.72 \times 10^{-2}$  mM, T = 30 °C.

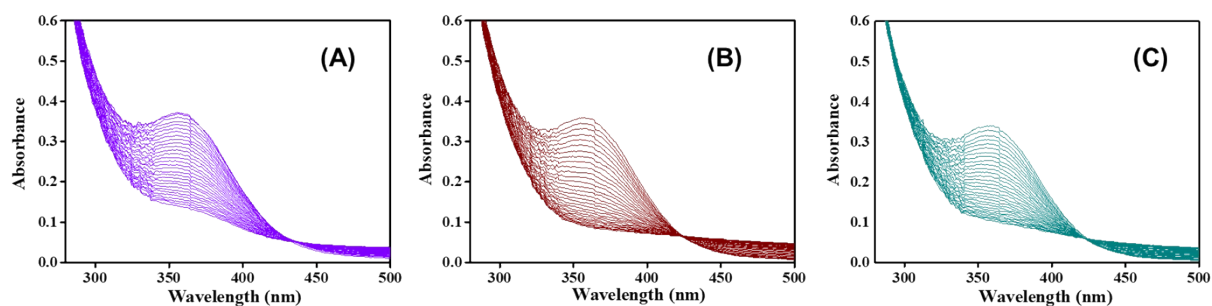


Figure S7. UV-vis scanned absorption spectra of benzyl alcohol oxidation by DPA in presence of CPC surfactant at 3 min interval for 1 mM CPC (A), 2 mM CPC (B), and 2 min interval for 3 mM CPC (C). Condition: [benzyl alcohol] =  $2.72 \times 10^{-1}$  mM, [DPA] =  $2.72 \times 10^{-2}$  mM, T = 30 °C.



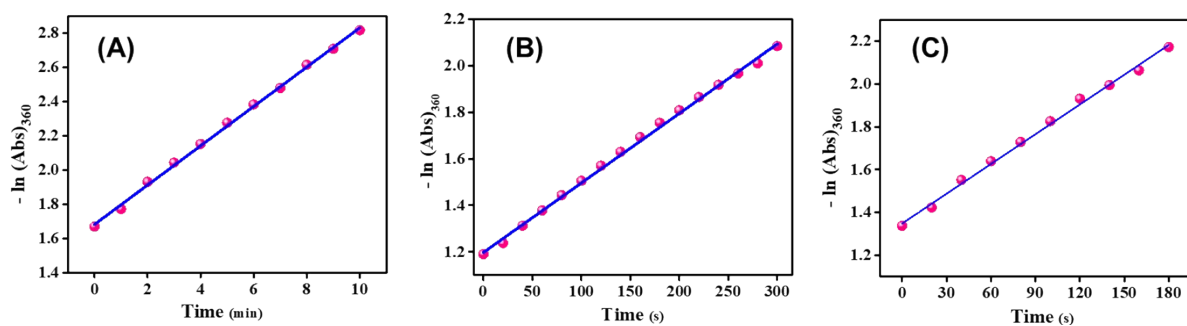


Figure S8. The representative plot of  $-\ln(\text{Abs})_{360}$  vs time for the studied oxidation kinetics in presence of mixed micelle constituted by CPC:Brij-35 having mole fraction ratio 3:1 (A), 1:3 (B), and 2:2 (C).

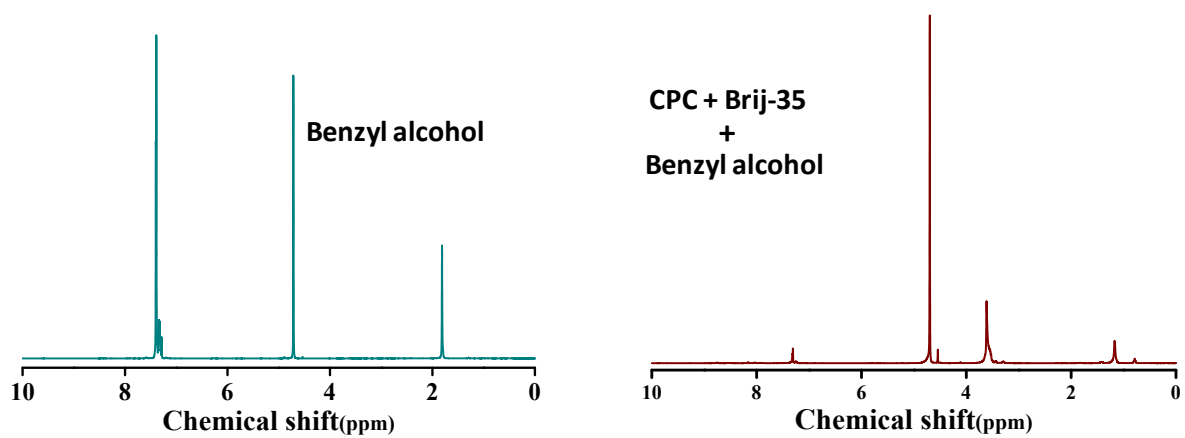


Figure S9:  $^1\text{H}$  NMR spectrum of mixed surfactants with benzyl alcohol and benzyl alcohol itself respectively.

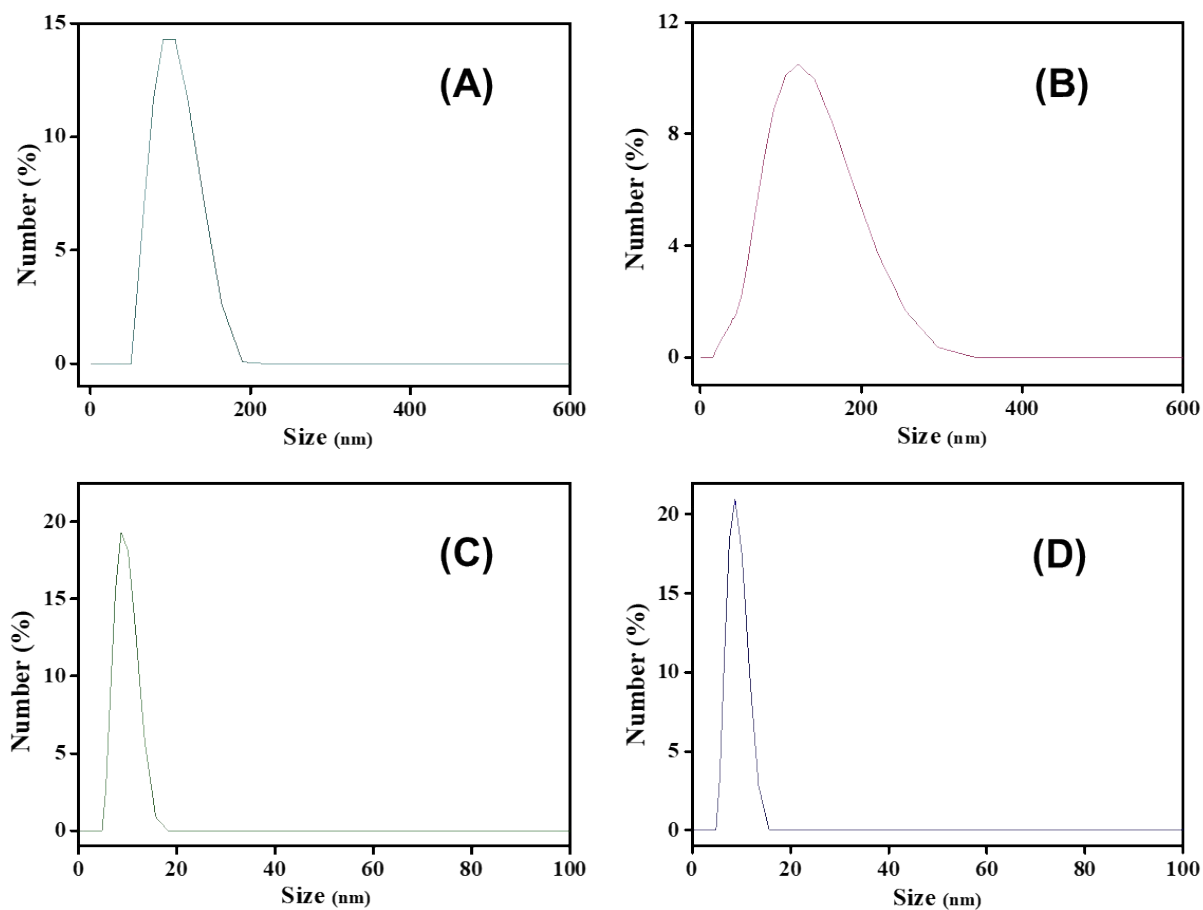


Figure S10. The size of micellar nanoaggregates of CPC (A) and Brij-35 (C) surfactants in aqueous media and the alteration of hydrodynamic diameter observed in presence of benzyl alcohol for CPC (B) and Brij-35 (D) surfactants.

Table S1. <sup>1</sup>H NMR values of CPC, Brij-35, and mixture of CPC and Brij-35.

Compositions	a-H's	b-H's	c-H's	d-H's	m-H's	bulk-H's	p-H's	q-H's	r-H's	s-H's	t-H's
CPC					0.68	1.08-1.27	4.69	1.96	8.95	8.09	8.57
Brij-35	0.85	1.26	1.53	3.55-3.76							
CPC + Brij-35	0.82	1.13-1.36	1.53	3.40-3.66	0.82	1.13-1.36	4.15-4.32	1.98	8.90	8.14	8.62