Supporting information

Simultaneous determination of Ciprofloxacin and Paracetamol by Adsorptive Stripping Voltammetry using Copper Zinc Ferrite nanoparticles modified carbon paste electrode

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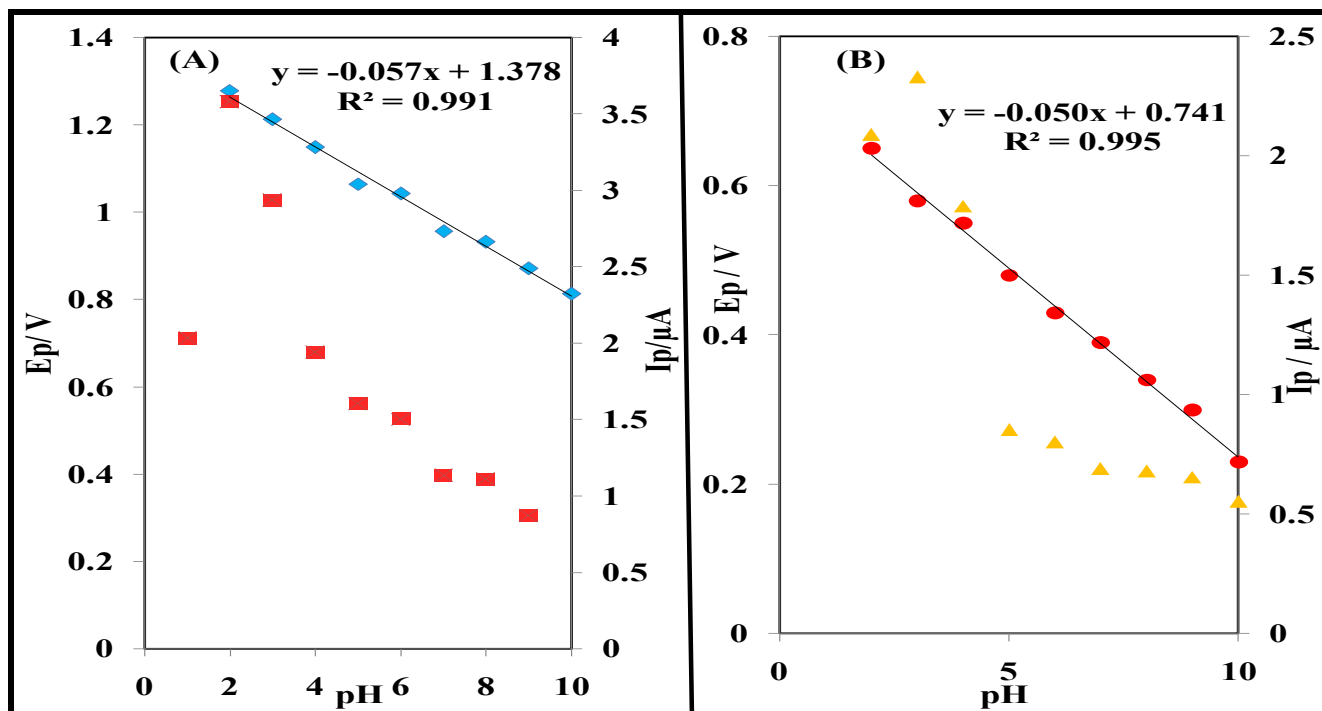E-mail: - aksrivastava@chem.mu.ac.in, akschbu@yahoo.com

Fig. S1 : DPV plot of (A) I_p *vs.* pH (■■■■)and E_p *vs.* pH (◆◆◆ ◆)for 5.00×10^{-5} M CIP and (B) I_p *vs.* pH (▲ ▲ ▲) and E_p *vs.* pH (●●●) for 1.00×10^{-6} M PA at CPE.
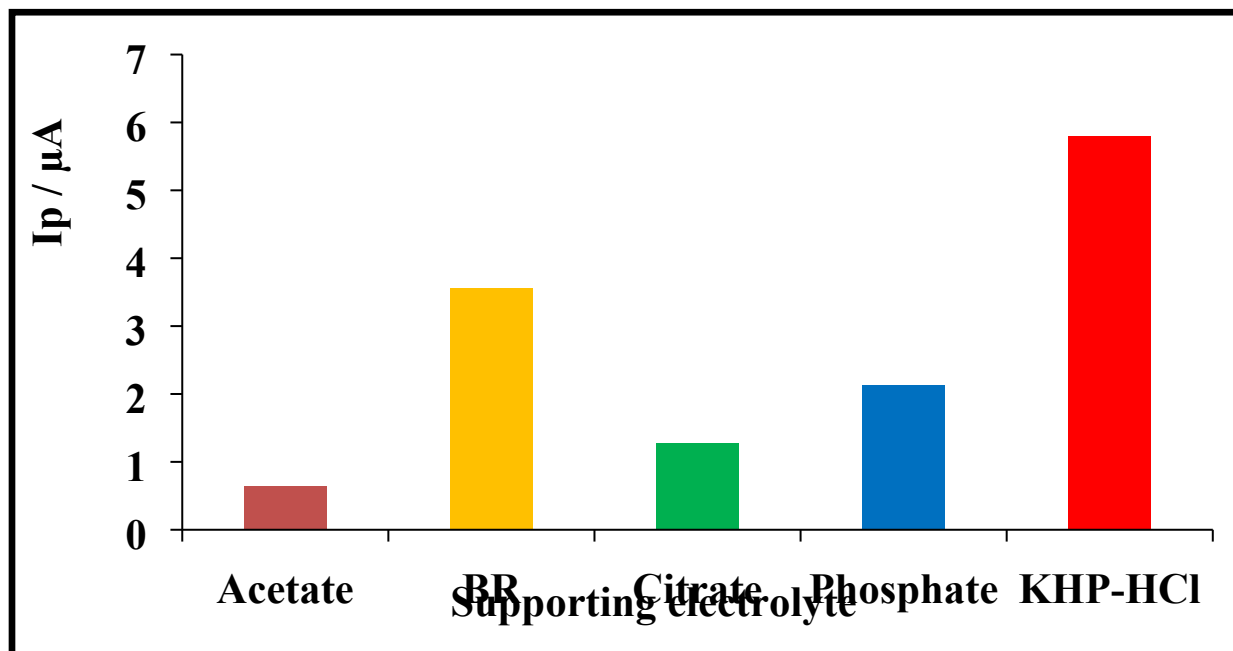

Fig. S2: Effect of supporting electrolytes (pH 3.0) on anodic peak current of 5.00×10^{-5}M CIP at CPE
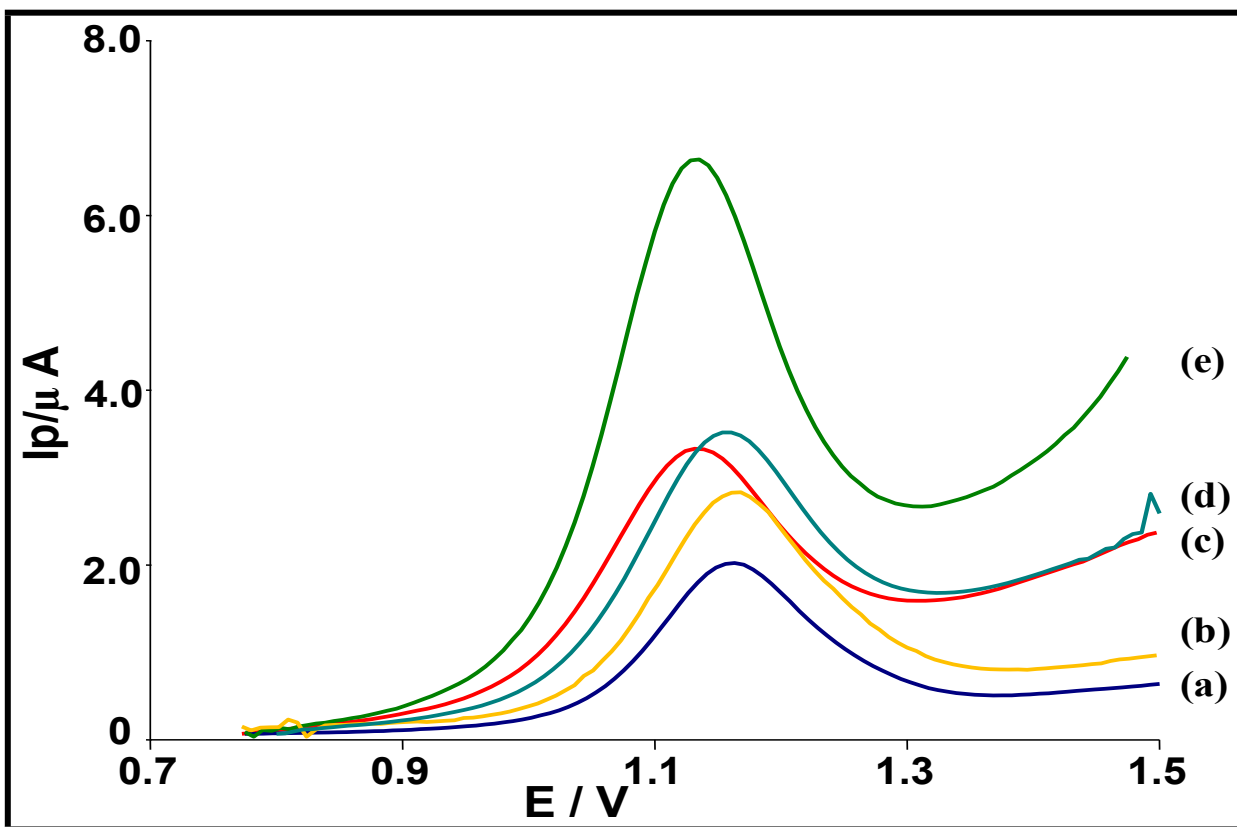
Fig. S3 : DPV of for 5.00×10^{-5} M CIP in 0.05M KHP (pH 3.0) (a) carbon paste electrodes (b) Zinc ferrite carbon paste electrode (c) magnetite carbon paste electrode (d) Copper ferrite carbon paste electrode and (e) Copper Zinc ferrite carbon paste electrode (CZF-CME).
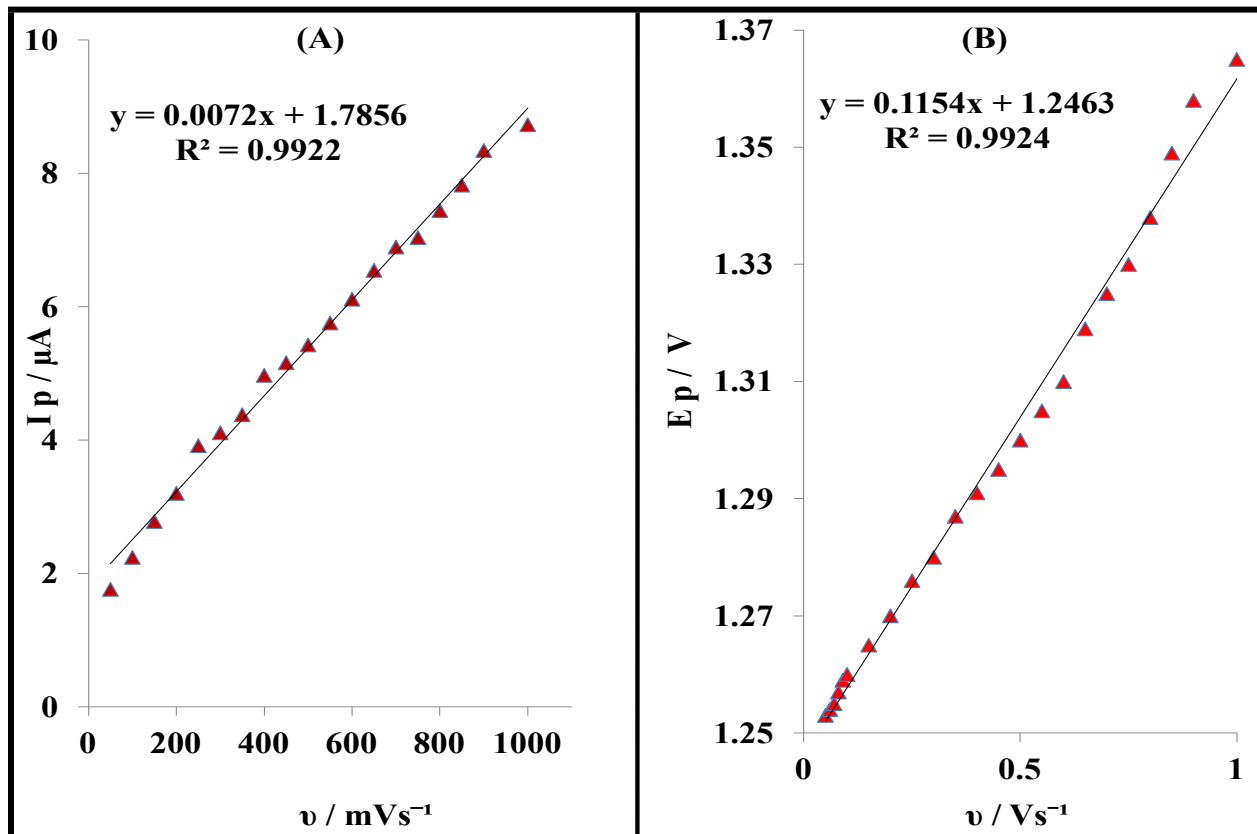
Fig. S4 (A) Plot of I_p *vs* υ (B) Plot of E_p *vs* υ for 5.00×10^{-5}M CIP in 0.05M KHP (pH 3.0) at CZF-CME
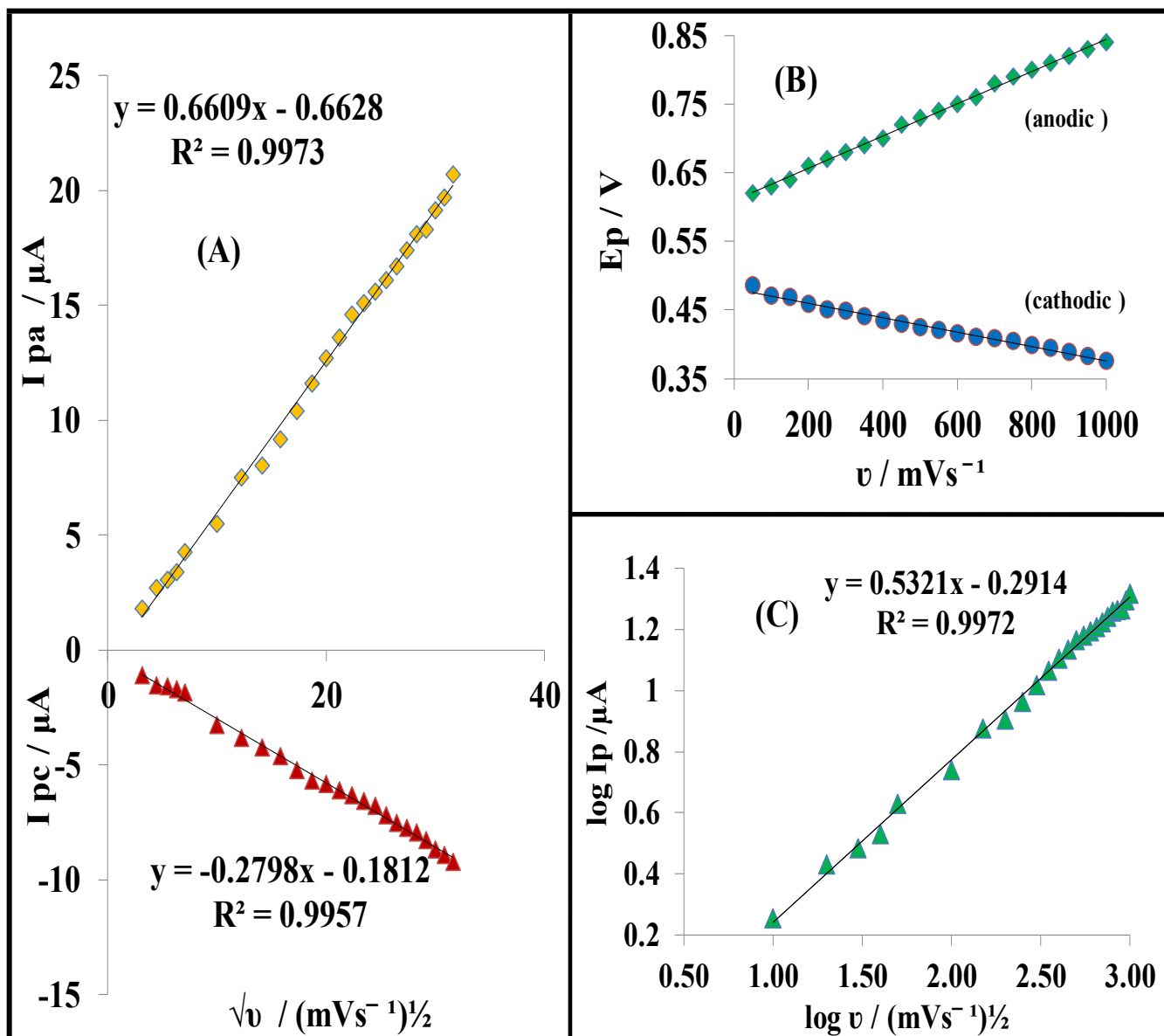
Fig. S5: (A) Plot of I_p (anodic and cathodic peak) *vs* $\sqrt{\upsilon}$ (B) Plot of E_p (anodic and cathodic peak) *vs* υ (C) Plot of log I_p (anodic peak) *vs* log υ for 1.00×10^{-6} M PA in 0.05M KHP (pH 3.0) at CZF-CME
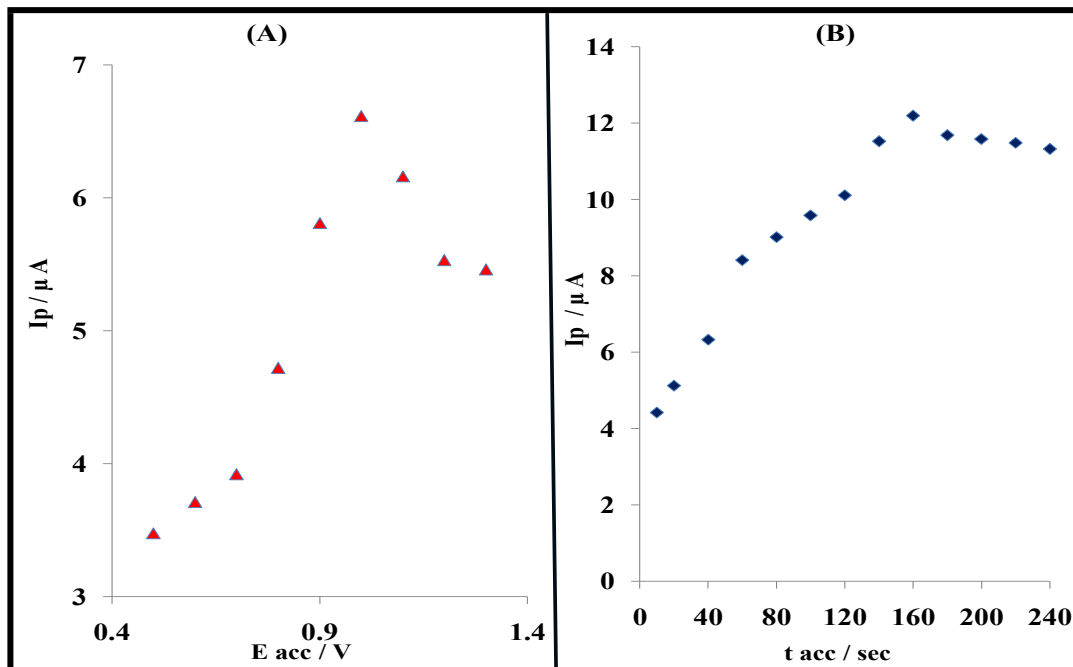
Fig. S6: Influence of **(A)** accumulation potential and **(B)** accumulation time on the oxidation peak current of 5.00×10^{-5} M CIP at CZF-CME in 0.05 M KHP-HCl (pH 3.0)

Electrode	Graphite (mg)	Copper Zinc Ferrite nanoparticles (mg)	Mineral oil (mg)
CZF – CME1	64	6	30
CZF –CME2	62	8	30
CZF –CME3 (CZF –CME)	**60**	**10**	**30**
CZF – CME4	59	11	30
CZF – CME5	58	12	30

Table S1: Composition of various modified electrode with the weight ratios of graphite: Copper Zinc Ferrite nanoparticles: mineral oil

Parameter	AdSDPV
pH	3
Supporting Electrolyte	0.05M KHP-HCl
Accumulation Potential	1.0 V
Accumulation Time	160 seconds
Stirring rate	800 rpm
Pulse amplitude	60mV
Pulse step	0.005V
Scan rate	100mVs^{-1}

Table S2: Optimal parameters for determination of CIP and PA simultaneously by AdSDPV technique.

	Ciprofloxacin			Paracetamol		
	std drug added 10^{-6} **M**	**Drug conc** 10^{-6} **M**	**Apparent Recovery (%)** $\pm$ **RSD**	**std drug added** 10^{-5} **M**	**Drug conc** 10^{-5} **M**	**Apparent Recovery (%)** $\pm$ **RSD**
Ciplox + Crocin	—	9.09	—	—	6.11	—
	24.21	34.13	102.4 ± 2.1	3.64	9.86	101.1 ± 1.23
	40.91	52.15	104.3 ± 1.17	13.33	19.31	99.3 ± 1.73
	57.51	65.9	98.9 ± 1.45	24.40	31.95	104.7 ± 2.45
Zoxan Eye/Ear drops	—	3.61	—	—	—	—
	1.81	5.35	98.7 ± 1.61	—	—	—
	3.33	7.09	102.2 ± 1.56	—	—	—
	4.61	8.35	101.6 ± 1.84	—	—	—
Flexon	—	—	—	–	3.64	–
	—	—	—	1.33	5.03	101.2 ± 2.23
	—	—	—	2.40	5.95	98.5 ± 1.61
	—	—	—	2.66	6.52	103.5± 1.98
Blood Serum	—	ND	—	—	ND	—
	0.75	0.78	104.0 ± 2.49	0.78	0.81	103.8 ± 2.95
	1.65	1.62	98.2 ± 3.43	3.81	3.77	98.9 ± 2.72

	5.48	5.56	101.4 ± 2.21	6.42	6.47	100.7 ± 1.69
	9.37	9.28	99.0 ± 2.84	8.49	8.58	101.1 ± 2.53
Urine	—	ND	—	—	ND	—
	4.85	4.83	99.6 ± 2.71	3.69	3.64	98.6 ± 2.53
	8.49	8.54	100.6 ± 3.13	5.42	5.48	101.1 ± 3.27
	11.54	11.39	98.7 ±2.49	10.72	10.78	100.5 ± 2.76
	13.67	13.79	100.9 ± 1.96	12.18	12.36	101.5 ± 2.99

Table S3: Recovery test for CIP and/or PA in pharmaceutical, blood serum and urine samples (n=5) at CZF-CME in 0.05M KHP-HCl (pH 3.0) by AdSDPV