ELECTRONIC SUPPLEMENTARY INFORMATION

Synthesis, characterization and electrochemical properties of bis(μ_2-perchlorato)tricopper (II) complexes derived from succinoyldihydrazones

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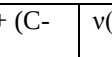
Table S1**:** Effective magnetic moment, magnetic parameters and electronic spectral data for homotrinuclear copper (II) complexes derived from succinoyldihydrazones

Sl. No.	Complex	Magnetic Moment μ_{eff} (BM)		Temp	Solid/ Solution	$g_{\parallel}$	$g_{\perp}$	g_{av}	$A_{\parallel}$ (A_3)	$\Delta M_s=2$	$A_{\perp}$ (A_1)	$g_{\parallel}/A_{\parallel}$	Eletronic Spectral bands λ_{max} (nm), ε_{max} ($dm^3cm^{-1}mol^{-1}$)	
		Per molecular formula	Per emperical formula										Solid	Solution
1.	$[Cu_3(L^1)(ClO_4)_2]$	1.79	1.04	RT LNT LNT	Solid Solid Solution	- 2.219 2.281	- 2.032 2.038	2.038 2.094 2.119	- 180 95	- - -	- 55 60	- 132.3 257.5	440, 640	300(9690),317(8581), 381(8570), 650(65) [293(7100),330(5200)][a]
2.	$[Cu_3(L^2)(ClO_4)_2(H_2O)_3]$	1.87	1.08	RT LNT LNT	Solid Solid Solution	- 2.219 2.169	- 2.026 2.041	2.051 2.090 2.082	- 180 120	- 4.064 -	- 55 -	- 132.2 193.9	470, 660	330(22000), 420 (21300), 520 (224) [312(5400), 327 (6200), 365 (5800), 382 (5400)][a]
3.	$[Cu_3(L^3)(ClO_4)_2]$	2.45	1.42	RT LNT LNT	Solid Solid Solution	- - 2.193	- - 2.048	2.048 2.048 2.096	- - 140	- - -	- - 30	- - 168.0	330, 405, 620	305(23250), 320(21250), 393 (21500), 650 (77) [292(8500), 340 (6600), 352 (5600)][a]

a, ligand bands are given in square bracket

Table S2: Structurally significant infrared (IR) bands (in cm^{-1}) for succinoyldihydrazones and their homotrinuclear copper (II) complexes.

Sl. No.	Ligand/ complex	ν(OH+NH)	ν(C=O)	ν(C=N)	Amide II + (C-O)Phenyl/ Naphthyl	ν(NCO-)	ν(C-O)	ν()	ν(M-O) (Phenolic)	ν(M-O) (enolate)	ν(M-N)	$\nu(ClO_4)^-$
	(H_4L^1)	3421 (s) 3199 (s)	1659 (s)	1609 (s) 1622 (s)	1566 (s)	-	1269 (s)	-	-	-	-	
	(H_4L^2)	3235 (s)	1675 (s)	1604 (ssh) 1623 (s)	1530 (s)	-	1280 (m)	-	-	-	-	
	(H_4L^3)	3433 (m) 3190 (m)	1669 (s)	1615 (s)	1564 (s)	-	1267 (s)	-	-	-	-	
1.	$[Cu_3(L^1)(ClO_4)_2]$	3433(mbr)	-	1603 (s)	1533 (s)	1533 [a] (s)	1280 (m)	680(w) 491(m)	536 (w)	449 (w) 426 (w)	356(m) 338(m)	1155 (msh), 1121 (s), 1100(s), 1080 (ssh)
2.	$[Cu_3(L^2)(ClO_4)_2(H_2O)_3]$	3430 (s) 3212 (s)	-	1618 (s) 1598 (s)	1551 (s)	1539(s)	1301(w) 1281 (m)	626(m) 484(m)	539 (w)	458 (w) 426(w)	386 (w) 329(w)	1143(s) 1121(s) 1109(s) 1090(s)
3.	$[Cu_3(L^3)(ClO_4)_2]$	3491(sbr)	-	1596 (s)	1540 (s)	1521 (s)	1276(m)	651(m) 492(m)	548 (w)	448 (w) 430 (w)	384(m) 303(w)	1175(s) 1140 (s), 1110 (s), 1080(s)

a, masked by ligand band

Table S3: Peak assignment in the mass spectra of homotrinuclear copper (II) complexes

SI. No.	Complex	Molecular ions	Expt. Mass	Theo. Mass
1	$[Cu_3(L^1)(ClO_4)_2]$	$[Cu_3(H_5L^1)(HClO_4)_2(DMSO)_4(H_2O)_2]^+$	1094.77	1094.65
		$[Cu_3(L^1)(ClO_4)_2(DMSO)_3(H_2O)_3]^+$	1027.63	1027.65
		$[Cu_3(HL^1)(ClO_4)_2(DMSO)_2(H_2O)_3]^+$	950.70	950.65
		$[Cu_3(HL^1)(H_2O)]^+$	559.04	559.65
2	$[Cu_3(L^2)(ClO_4)_2(H_2O)_3]$	$[Cu_3(L^2)(ClO_4)_2(DMSO)]^+$	917.82	917.65
		$[Cu_3(L^2)(ClO_4)(DMSO)(H_2O)]^+$	834.94	836.15
		$[Cu_3(L^2)(DMSO)(H_2O)]^+$	735.10	736.65
		$[Cu_3(L^2)(H_2O)]^+$	658.91	658.65
		$[Cu_2(L^2)(H_2O)]^+$	594.06, 596.11	595.10
		$[Cu_2(L^2)]^+$	577.02,578.92	577.10
3	$[Cu_3(L^3)(ClO_4)_2]$	$[Cu_3(H_4L^3)(ClO_4)_2(H_2O)_3]^+$	956.17	955.65
		$[Cu_3(H_4L^3)(ClO_4)]^+$	802.45	802.15

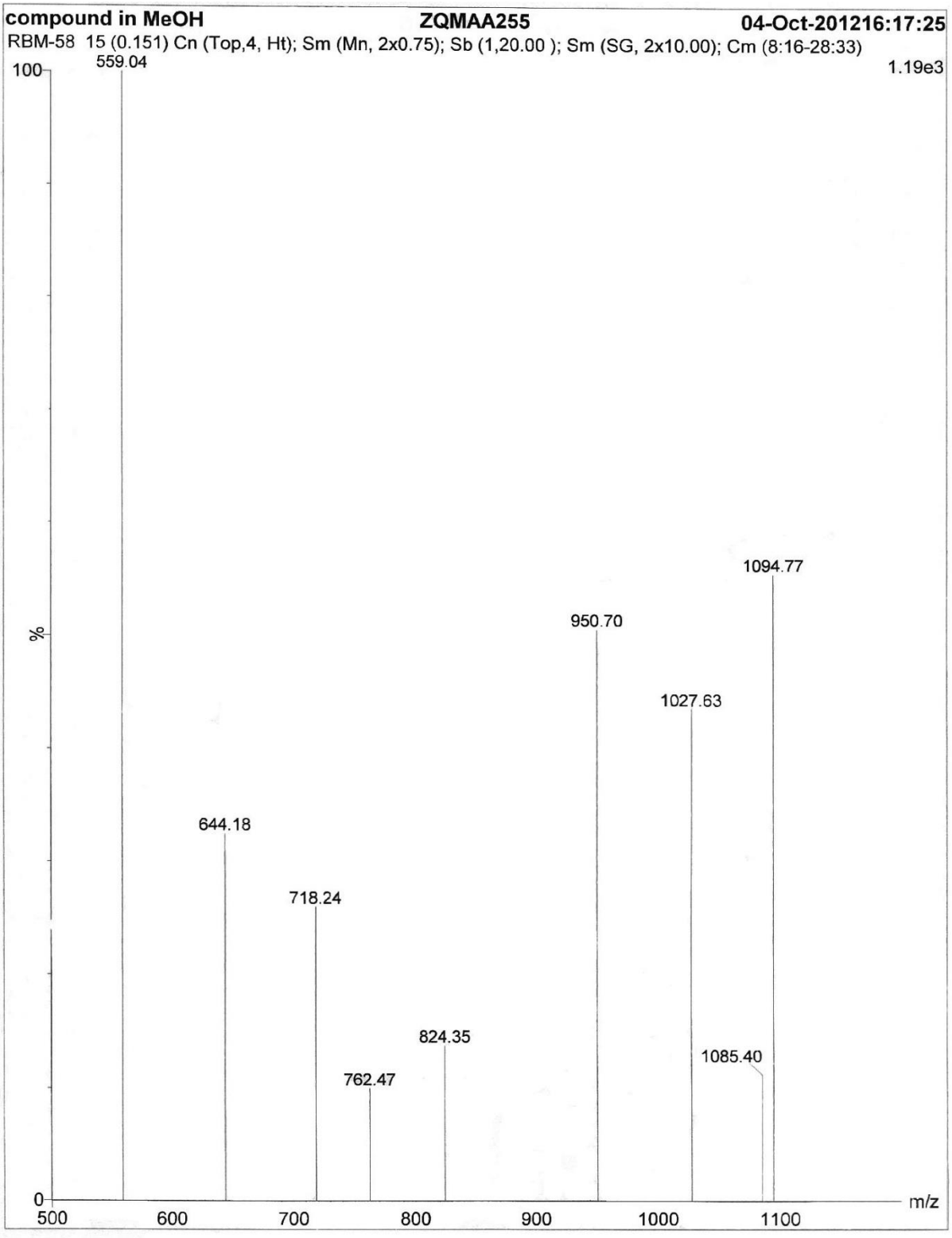


Fig. S1. Mass spectrum of the complex $[Cu_3(L^1)(ClO_4)_2]$ (**1**) in DMSO solution.

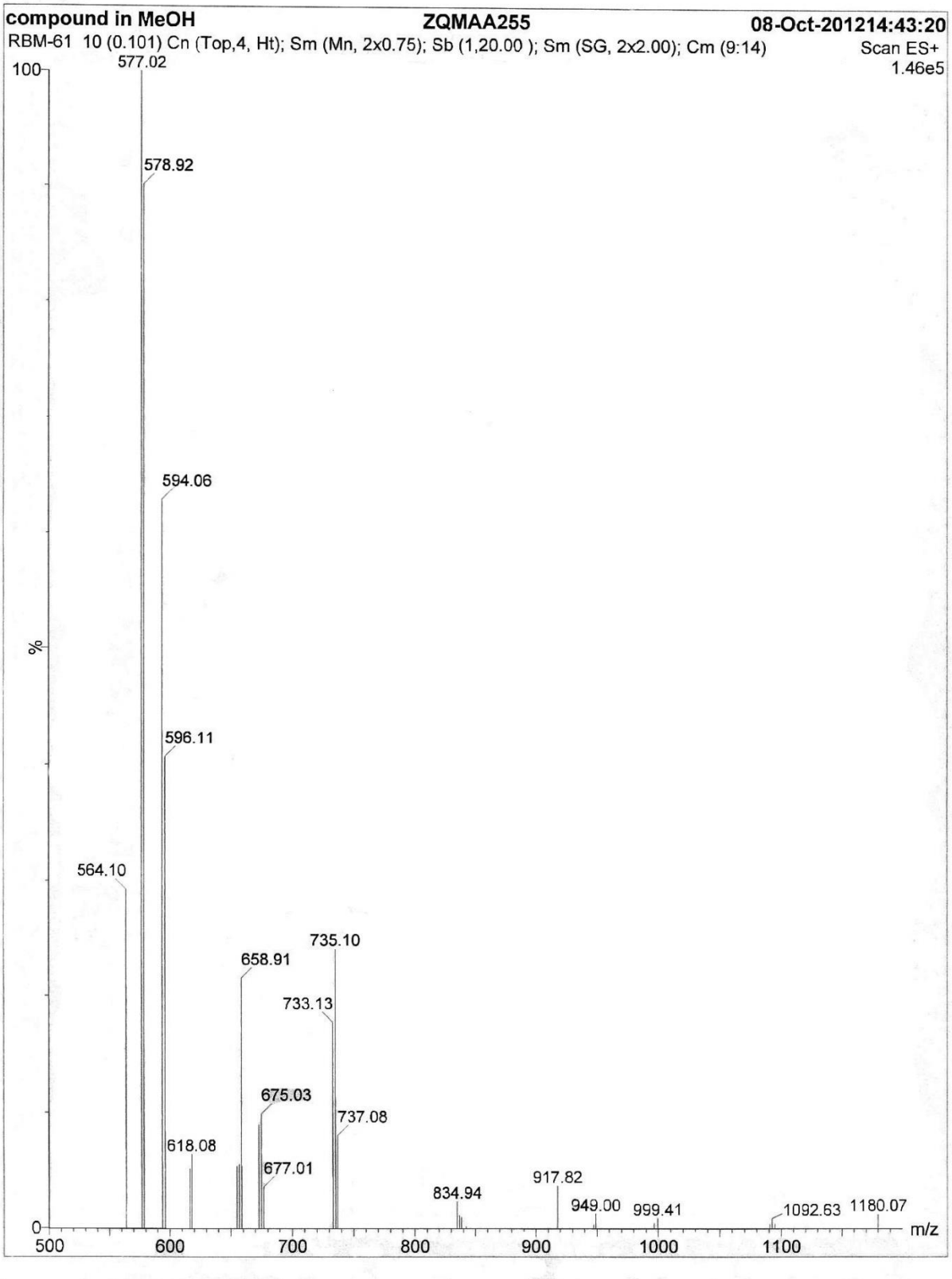


Fig. S2. Mass spectrum of the complex $[Cu_3(L^2)(ClO_4)_2(H_2O)_3]$ (**2**) in DMSO solution.

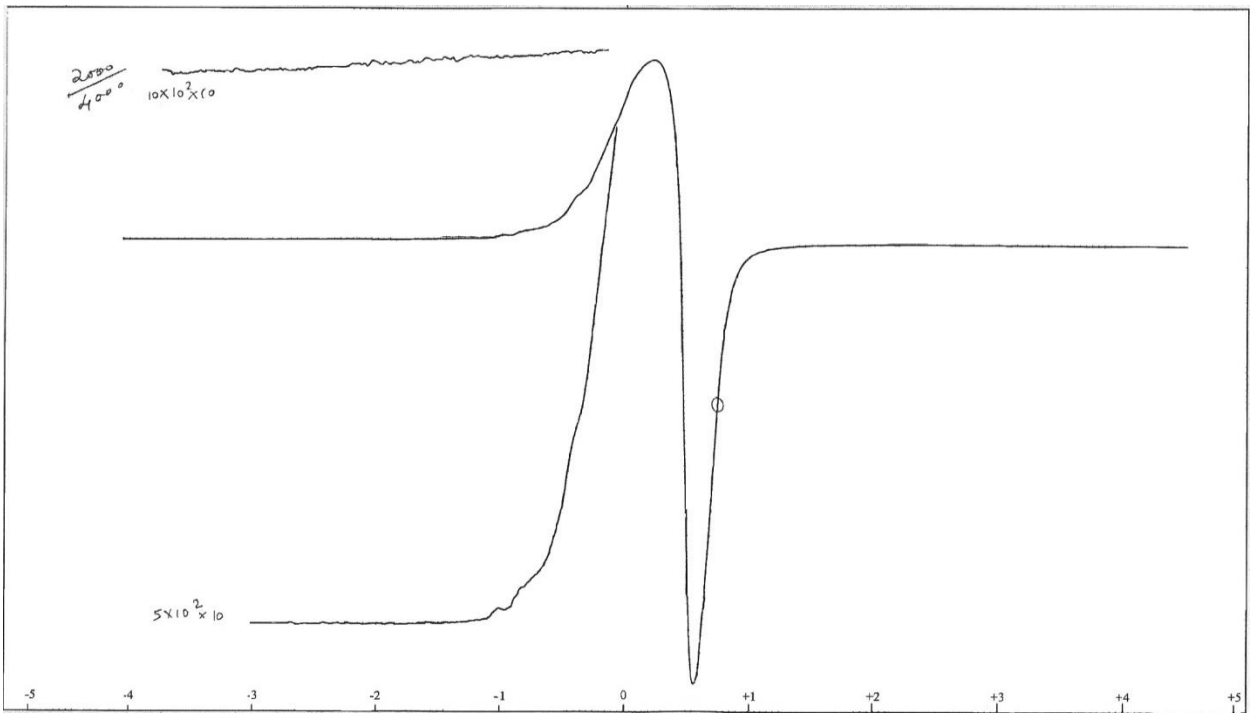


Fig.S3. EPR spectrum of the complex $[Cu_3(L^2)(ClO_4)_2(H_2O)_3]$ (**2**) in DMSO glass at LNT (*f*= 9.1 Mz)

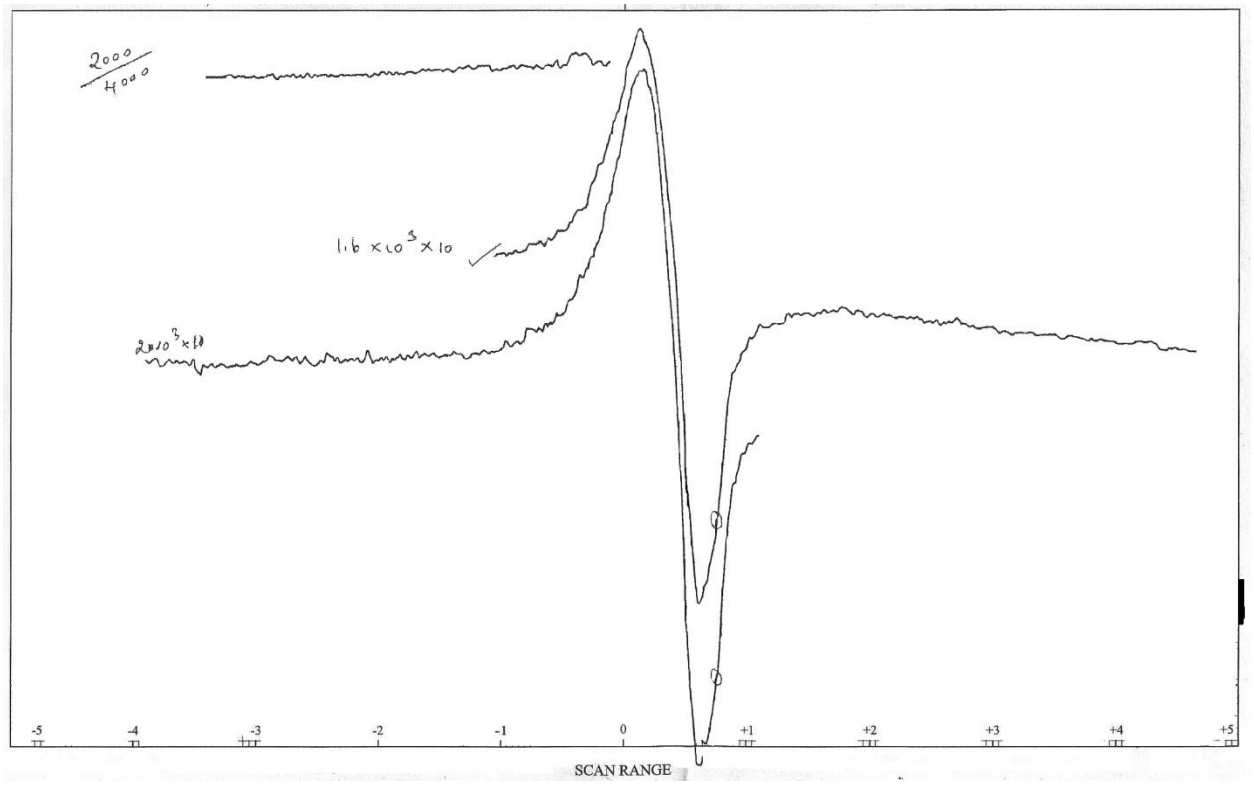


Fig.S4. EPR spectrum of the complex $[Cu_3(L^3)(ClO_4)_2]$ (**3**) in DMSO glass at LNT (*f*= 9.1 Mz)

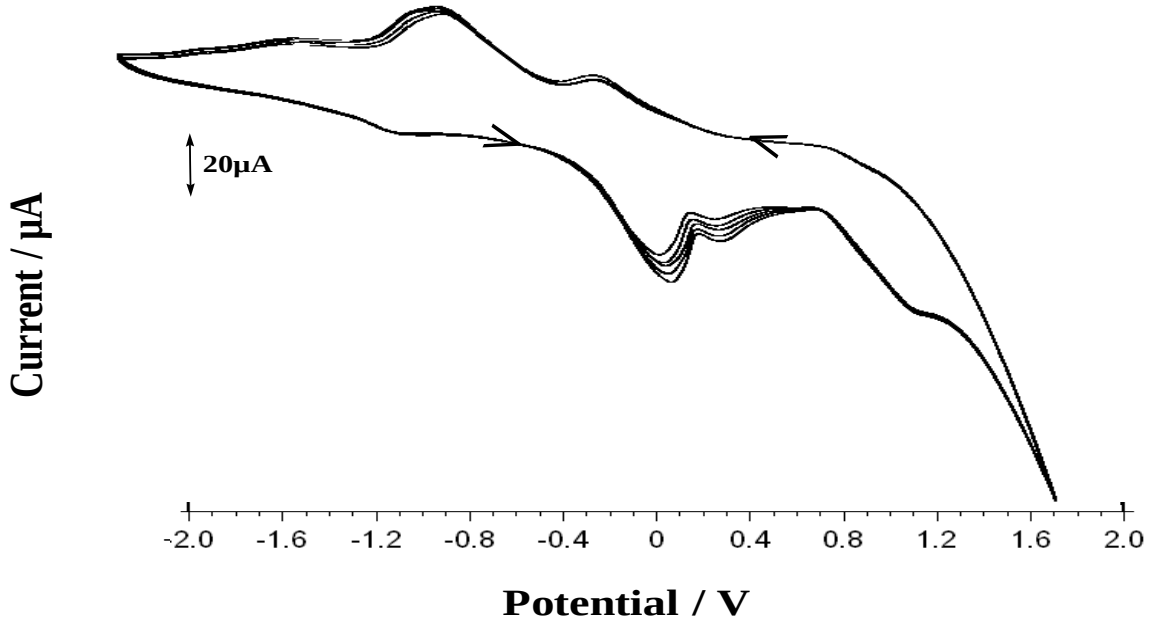


Fig. S5. Cyclic Voltammetry of complex $[Cu_3(L^2)(ClO_4)_2(H_2O)_3]$ (**2**) at 100 mV/s

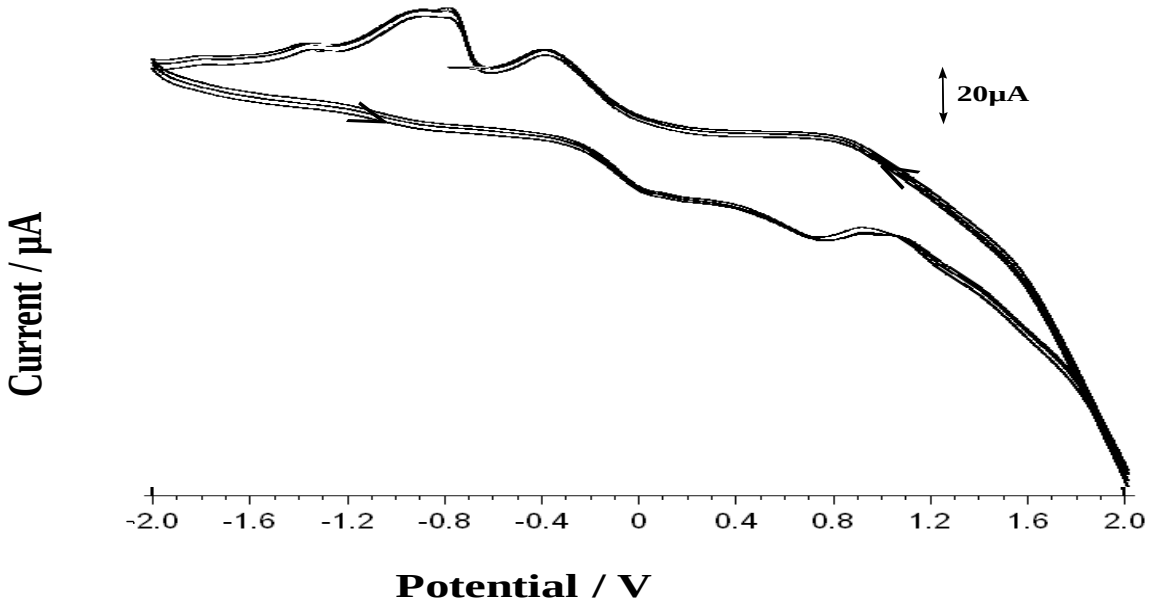


Fig. S6. Cyclic Voltammetry of complex $[Cu_3(L^3)(ClO_4)_2]$ (**3**) at 100 mV/s