

Designing of Fe₃O₄ Supported Reduced Graphene Oxide Based 1-D Copper(II) polymeric material: A Comparative Study on High-Performance supercapacitive Behaviour

Aditi Dhar,^a Sneha Biswas,^{#b} Nandini Barman,^{#c} Pappu Naskar,^c Tania Chowdhury,^{d*} Anjan Banerjee^{c*}, and Debasis Das^{a*}

^aDepartment of Chemistry, University College of Science, University of Calcutta, 92, A. P. C. Road, Kolkata 700009, India

^bSchool of Chemical Sciences, Indian Association for the Cultivation of Science, 2A & 2B, Raja S. C. Mullick Road, Jadavpur, Kolkata-700032, India

^cDepartment of Chemistry, Presidency University, Kolkata 86/1 College Street, Kolkata-700073, India

^dMacdermid Alpha Electronics Solutions India Pvt Ltd, 119/120, KIADB Industrial Area, SEZ Aerospace Park, Devanahalli Taluk, Bangalore Rural District – 562110

These authors contributed equally.

† Electronic supplementary information (ESI) available, CCDC reference no2424232

E-mail: dasdebasis2001@yahoo.com

No.	CONTENTS	Page No.
1.	Coordination bond lengths (Å) for Cu-complex Cu-dca (Table S1)	S2
2.	Bond Angles (°) for Cu-Complex Cu-dca (Table S2)	S2
3.	FT-IR spectrum of Cu-Complex Cu-dca(Fig. S1)	S3
4.	UV-Vis spectrum of Cu-Complex Cu-dca (Fig. S2)	S4
5.	ESI-MS of Cu-Complex Cu-dca ((Fig. S3))	S5
6.	Elemental Mapping of rGO (Fig. S4)	S6
7.	Elemental Mapping of rGO@Fe ₃ O ₄ (Fig. S5)	S6
8.	The b-value calculation for rGO@Fe ₃ O ₄ @CuL-dca (Fig. S6)	S7

Table S1 Bond Lengths for CuL-dca complex.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Cu(1)	O(1)	1.943 (2)	C(14)	C(9)	1.419 (5)
Cu(1)	N(2)	1.973 (3)	C(14)	C(13)	1.407 (5)
Cu(1)	N(1)	2.055 (3)	C(8)	C(9)	1.448 (5)
Cu(1)	N(3)	2.006 (3)	C(5)	C(6)	1.493 (5)
Cu(1)	O(1)	2.498 (2)	C(5)	C(4)	1.388 (5)
Cu(1)	N(4)	2.629 (3)	C(10)	C(9)	1.393 (5)
Br(1)	C(11)	1.901 (4)	C(10)	C(11)	1.369 (5)
O(1)	C(14)	1.304 (4)	C(16)	N(5)	1.135 (4)
N(2)	C(8)	1.275 (4)	C(7)	C(6)	1.510 (5)
N(2)	C(7)	1.462 (4)	C(12)	C(11)	1.391 (5)
N(1)	C(5)	1.350 (4)	C(12)	C(13)	1.369 (5)
N(1)	C(1)	1.348 (4)	C(1)	C(2)	1.366 (5)
N(3)	C(15)	1.140 (4)	C(3)	C(2)	1.366 (5)
N(4)	C(15)	1.313 (5)	C(3)	C(4)	1.366 (5)
N(4)	C(16)	1.301 (5)			

Table S2 Bond Angles for CuL-dca complex.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O(1)	Cu(1)	N(2)	89.44 (11)	N(1)	C(5)	C(6)	118.9 (3)
O(1)	Cu(1)	N(1)	173.70 (11)	N(1)	C(5)	C(4)	120.9 (3)
O(1)	Cu(1)	N(3)	85.04 (11)	C(4)	C(5)	C(6)	120.1 (3)
N(2)	Cu(1)	N(1)	94.42 (11)	C(11)	C(10)	C(9)	120.9 (3)
N(2)	Cu(1)	N(3)	169.60 (12)	C(14)	C(9)	C(8)	120.9 (3)
N(3)	Cu(1)	N(1)	91.87 (12)	C(10)	C(9)	C(14)	120.3 (3)
C(14)	O(1)	Cu(1)	122.5 (2)	C(10)	C(9)	C(8)	118.9 (3)
C(8)	N(2)	Cu(1)	124.3 (2)	N(5)	C(16)	N(4)	173.9 (4)
C(8)	N(2)	C(7)	118.2 (3)	N(2)	C(7)	C(6)	111.0 (3)
C(7)	N(2)	Cu(1)	117.3 (2)	C(13)	C(12)	C(11)	119.7 (3)
C(5)	N(1)	Cu(1)	125.4 (2)	C(5)	C(6)	C(7)	114.2 (3)
C(1)	N(1)	Cu(1)	117.2 (2)	C(10)	C(11)	Br(1)	120.4 (3)
C(1)	N(1)	C(5)	117.4 (3)	C(10)	C(11)	C(12)	119.9 (3)
C(15)	N(3)	Cu(1)	143.6 (3)	C(12)	C(11)	Br(1)	119.7 (3)
C(16)	N(4)	C(15)	121.6 (3)	C(12)	C(13)	C(14)	122.4 (3)
N(3)	C(15)	N(4)	174.5 (4)	N(1)	C(1)	C(2)	123.6 (4)
O(1)	C(14)	C(9)	123.0 (3)	C(4)	C(3)	C(2)	118.8 (4)
O(1)	C(14)	C(13)	120.4 (3)	C(1)	C(2)	C(3)	118.9 (4)
C(13)	C(14)	C(9)	116.6 (3)	C(3)	C(4)	C(5)	120.4 (4)
N(2)	C(8)	C(9)	126.2 (3)				

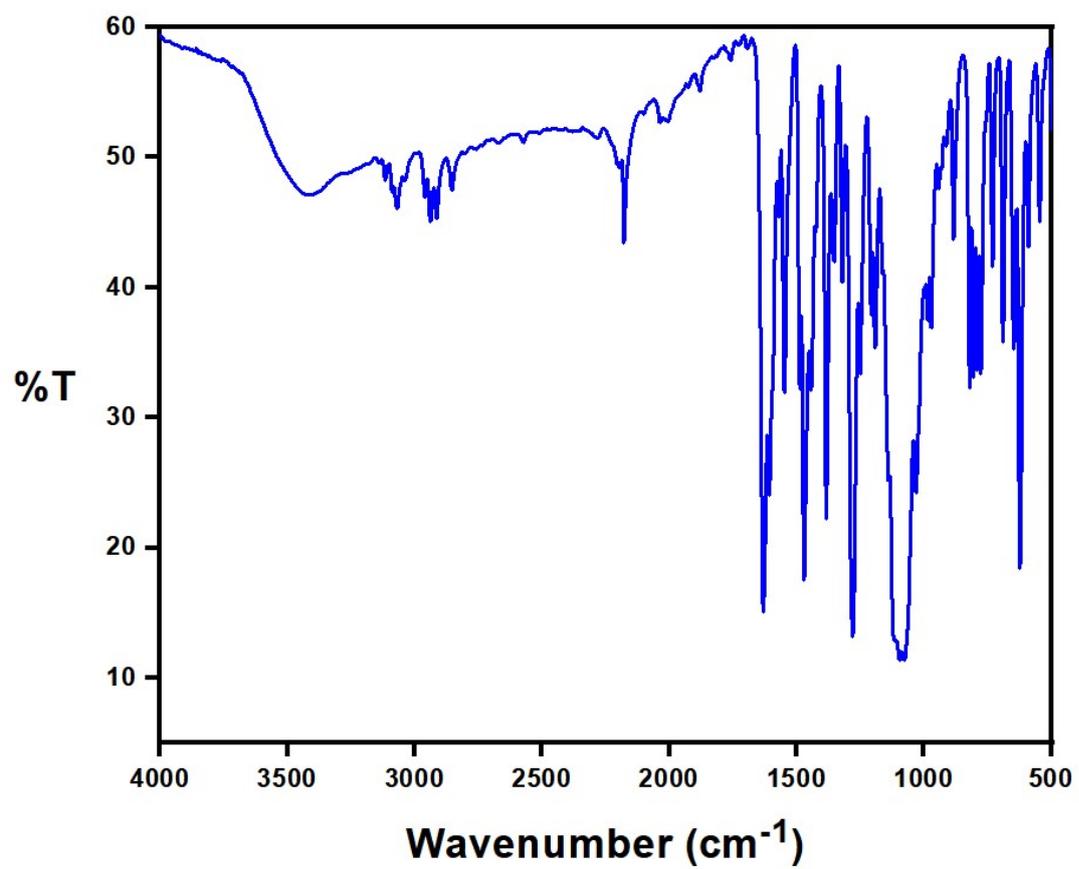


Fig. S1 FT-IR spectrum of Cu-complex CuL-dca

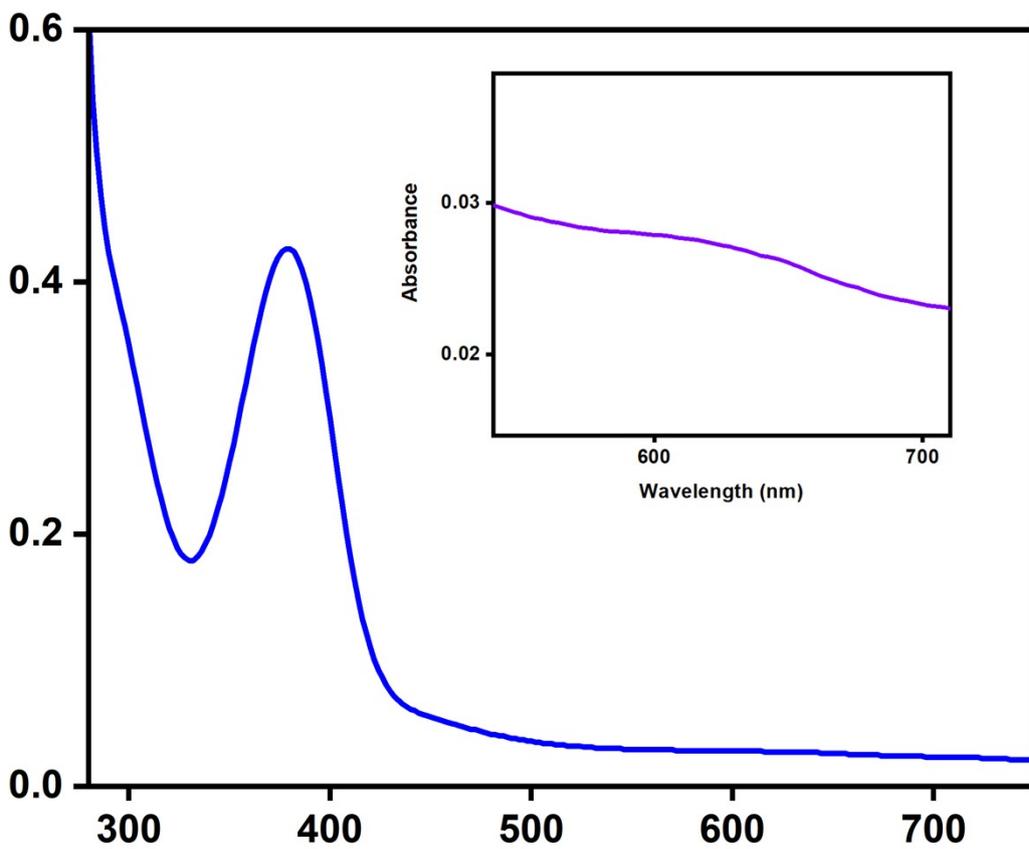


Fig. S2 UV-Vis spectrum of Cu-Complex Cu-dca

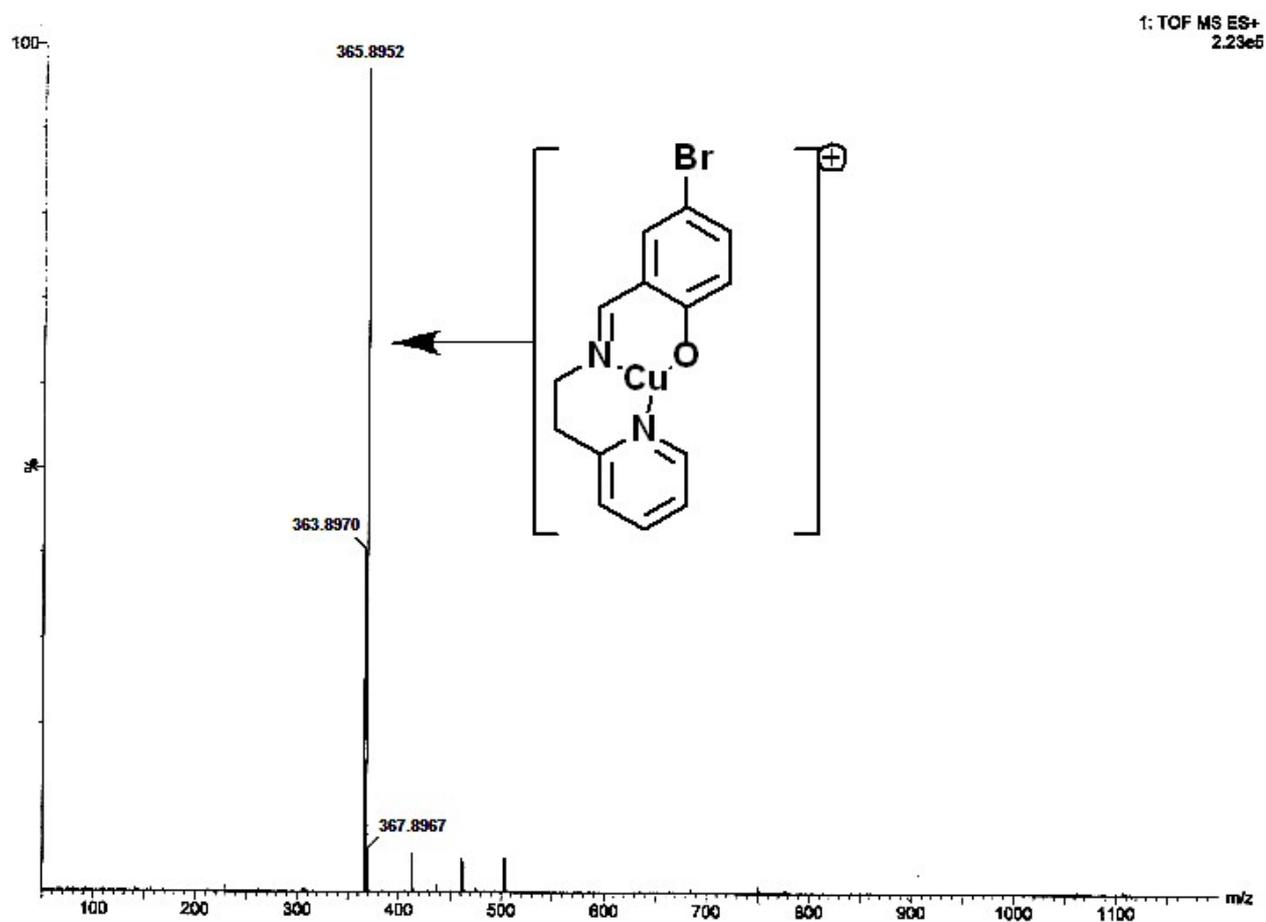


Fig. S3 ESI-MS of Cu-Complex Cu-dca

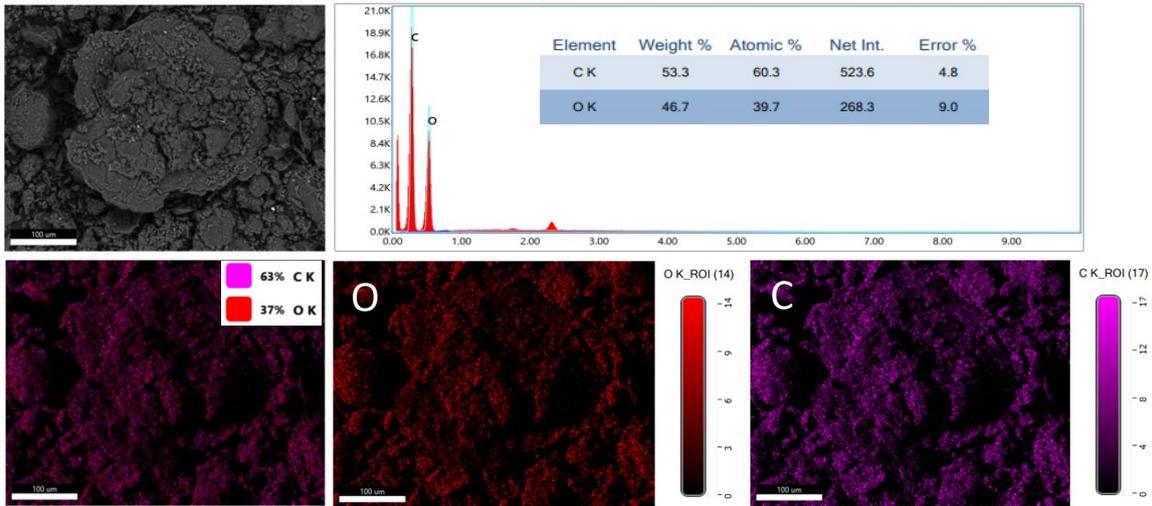


Fig. S4 Elemental Mapping of rGO

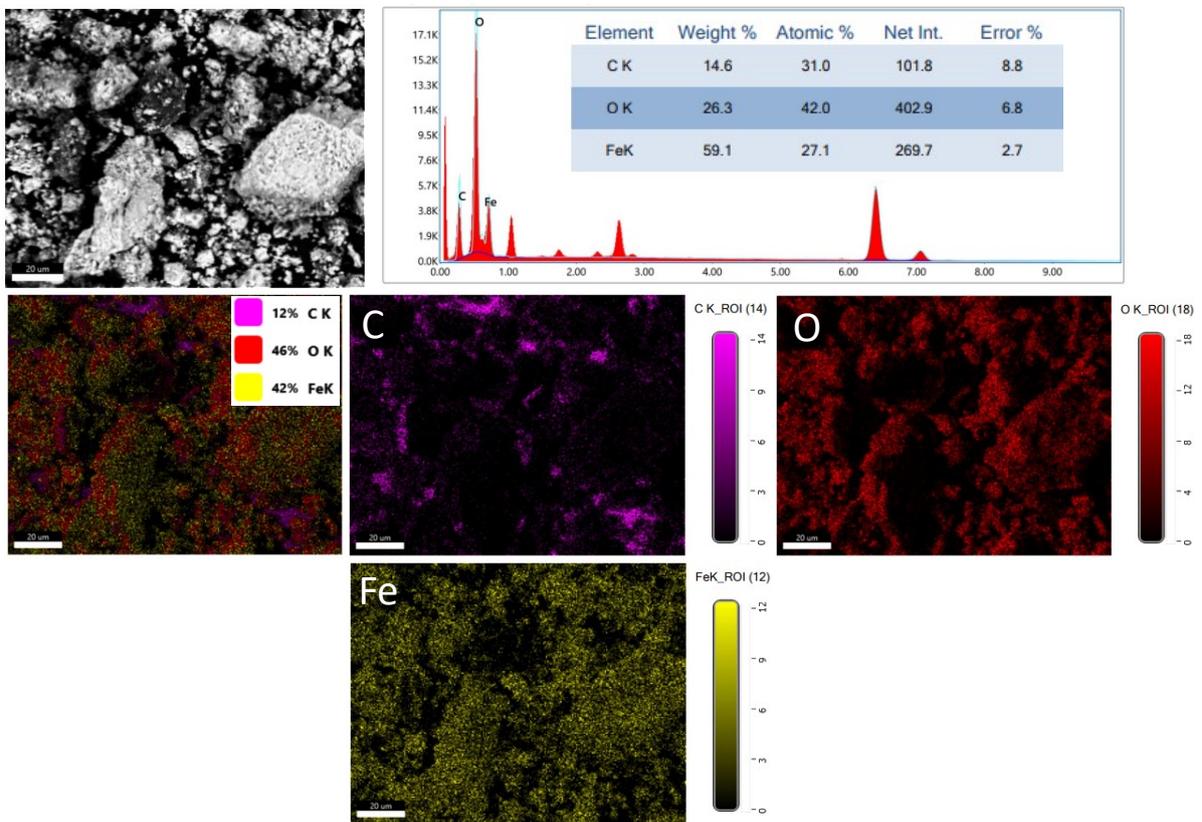


Fig. S5 Elemental Mapping of rGO@Fe₃O₄

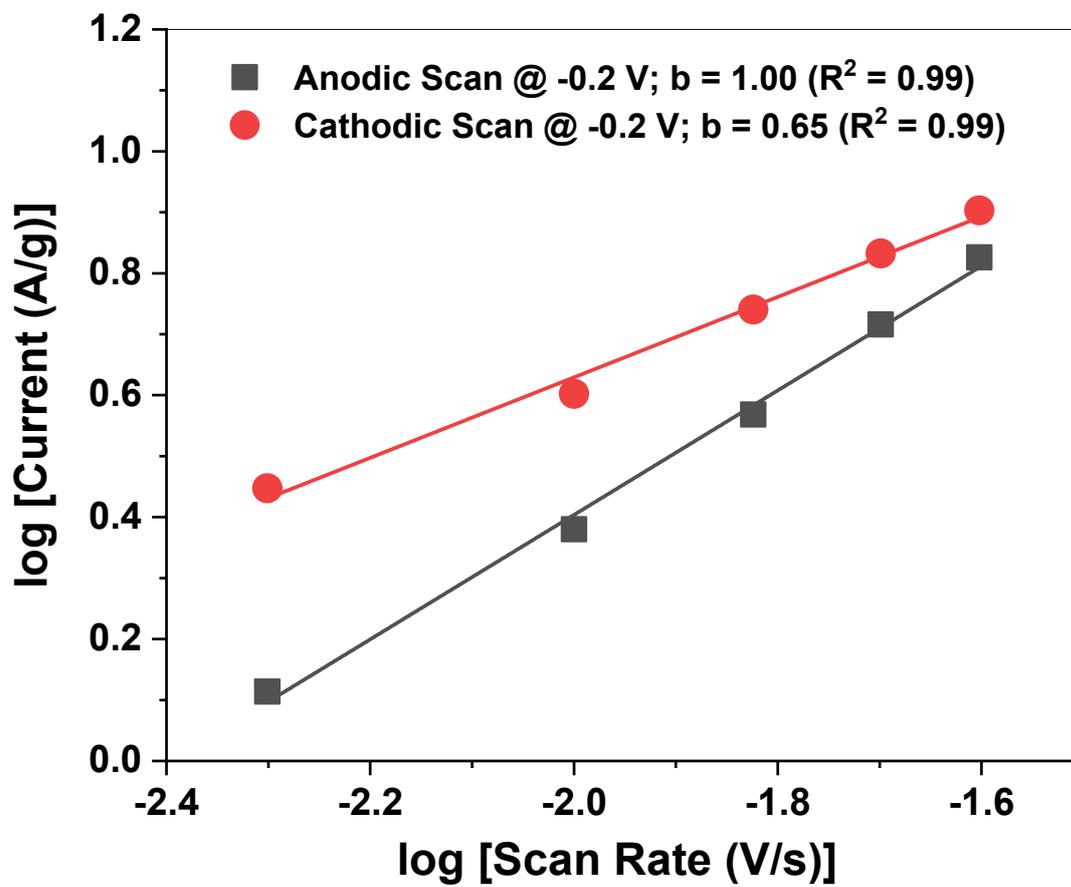


Fig. S6 The b-value calculation for rGO@Fe₃O₄@CuL-dca