Supplementary Materials

Cobalt(II) coordination polymer with 6-aminonicotinate and 1,2-bis(4-pyridyl)ethane as a new electrochemical sensor for determination of dopamine

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1. Crystal structures

Table S1. Selected bond lengths (Å) and angles (˚) for {[Co(1,2-bpe)$_2$(H$_2$O)$_2$](6-NH$_2$nic)(NO$_3$)·4H$_2$O}$_n$ (**1**).

1	
Bond lengths	
Co1–N1	2.138(3)
Co1–N2^{i}	2.170(3)
Co1–N3	2.134(3)
Co1–N4^{ii}	2.169(4)
Co1–O1	2.096(3)
Co1–O2	2.128(3)
Bond angles	
O1–Co1–O2	177.6(1)
O1–Co1–N3	91.1(1)
O2–Co1–N3	89.7(1)
O1–Co1–N1	88.6(1)
O2–Co1–N1	90.6(1)
N3–Co1–N1	179.4(2)
O1–Co1–N4^{ii}	90.5(1)
O2–Co1–N4^{ii}	87.2(1)
N3–Co1–N4^{ii}	90.4(1)
N1–Co1–N4^{ii}	89.1(1)
O1–Co1–N2^{i}	91.2(1)
O2–Co1–N2^{i}	91.1(1)
N3–Co1–N2^{i}	87.3(1)
N1–Co1–N2^{i}	93.2(1)
N4^{ii}–Co1–N2^{i}	177.1(1)

Symmetry codes (i): *x*, *y*-1, *z* and (ii): *x*, *y*+1, *z*.

Table S2. The hydrogen bond geometry for $\{[Co(1,2\text{-bpe})_2(H_2O)_2](6\text{-}NH_2nic)(NO_3)\cdot 4H_2O\}_n$ (**1**).

D–H···A	*d*(D–H)/Å	*d*(H···A)/Å	*d*(D···A)/Å	∠(D–H···A)/°	Symmetry code on A
N6–H61···O8	0.88(1)	2.07(2)	2.895(5)	157(4)	x, y-1, z
N6–H62···O7	0.88(1)	2.35(3)	3.163(5)	156(5)	x+1/2, -y+1, z
O1–H11···O11	0.84(1)	1.83(2)	2.658(4)	175(5)	x, y, z
O1–H12···O3	0.83(1)	1.88(2)	2.692(4)	164(5)	-x+3/2, y, z+1/2
O2–H21···O6	0.84(1)	1.90(2)	2.723(4)	169(4)	x, y, z
O2–H22···O4	0.84(1)	1.83(2)	2.665(4)	171(4)	x, y, z
O8–H81···O3	0.84(1)	1.82(2)	2.659(5)	175(5)	x, y, z
O8–H82···O2	0.84(1)	2.36(3)	3.072(5)	143(4)	x, y, z
O9–H91···O6	0.84(2)	1.98(2)	2.798(5)	166(5)	x, y, z
O9–H92···N5	0.84(2)	2.03(2)	2.874(5)	175(6)	x-1/2, -y+1, z
O10–H101···O4	0.84(1)	2.07(2)	2.904(4)	175(5)	-x+1, -y+1, z+1/2
O10–H102···O9	0.84(1)	1.96(2)	2.776(5)	165(5)	-x+1, -y+1, z+1/2
O11–H111···O7	0.83(1)	1.96(2)	2.778(4)	168(5)	-x+1, -y+2, z+1/2
O11–H112···O10	0.83(1)	1.92(2)	2.732(4)	164(5)	x, y, z
C2–H2···N6	0.95	2.62	3.539(6)	163	x-1/2, -y+1, z
C10–H10···O4	0.95	2.36	3.282(5)	163	x, y+1, z
C11–H11A···O11	0.95	2.41	3.355(6)	173	x, y+1, z
C24–H24···O6	0.95	2.49	3.428(5)	168	-x+3/2, y-1, z+1/2

Table S3. The application of GCE modified with polymer **1** for determination of dopamine (n = 3) in urine sample.

Sample no.	Added sample	Added standard DA (μmol L^{-1})	Peak current (μA)	Found (μmol L^{-1})	Recovery (%)	RSD (%)
1	100 μL	-	23.81			1.8
2		1	24.62	1.51	73.39	1.6
3		2	26.03	2.80	100.92	0.3
4		3	27.08	3.72	97.86	0.5
5		4	27.70	4.36	89.45	0.7

(Content of the sample found 0.78 μmol L^{-1}; 0.119 mg/L)

2. IR spectra

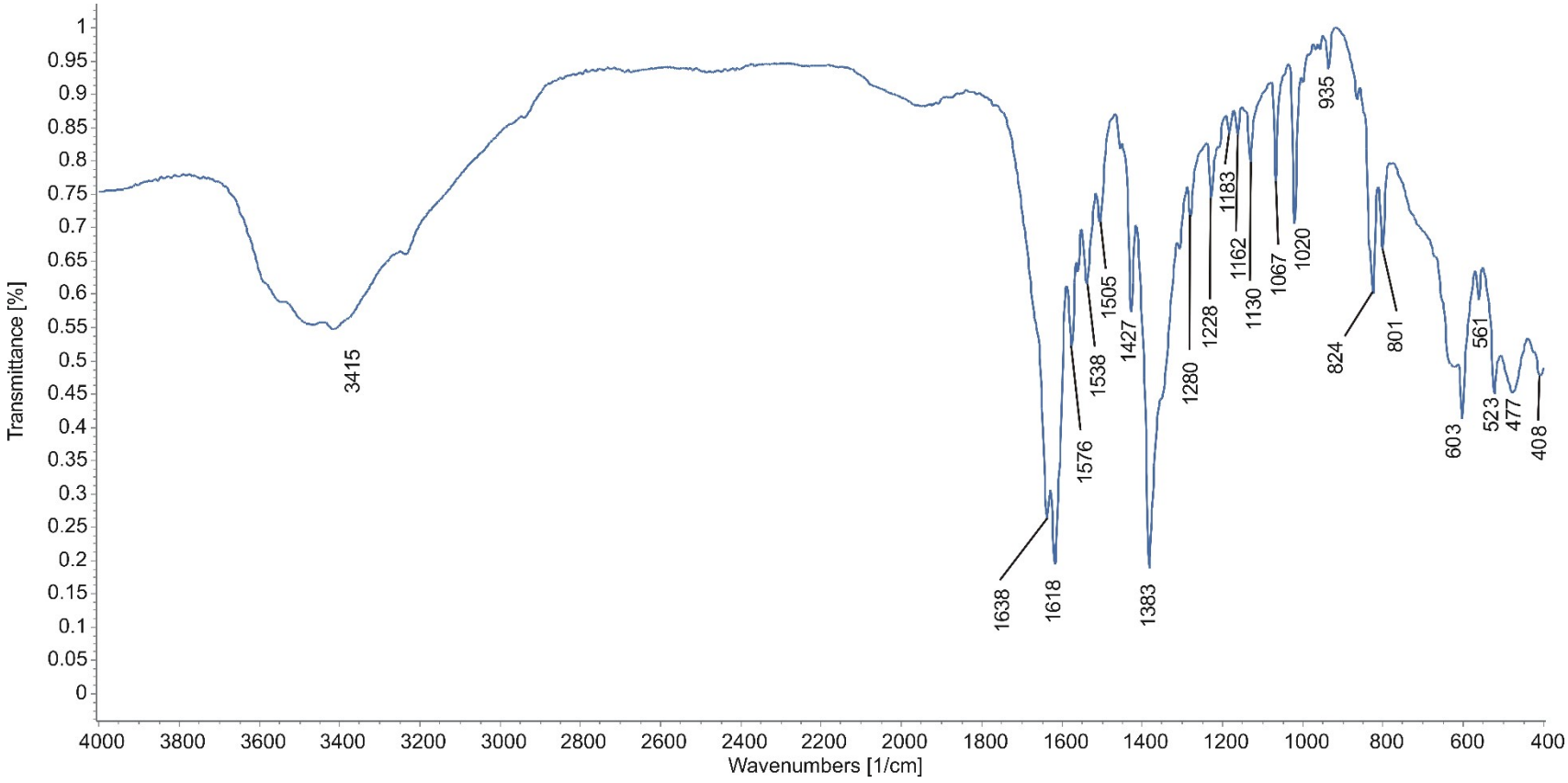
Transmittance [%]
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
Wavenumbers [1/cm]
3415
1638
1618
1576
1538
1505
1427
1383
1280
1228
1183
1162
1130
1067
1020
935
824
801
603
561
523
477
408

Figure S1. IR spectrum of $\{[Co(1,2\text{-bpe})_2(H_2O)_2](6\text{-}NH_2nic)(NO_3)\cdot 4H_2O\}_n$ (**1**).

3. TGA/DSC curves

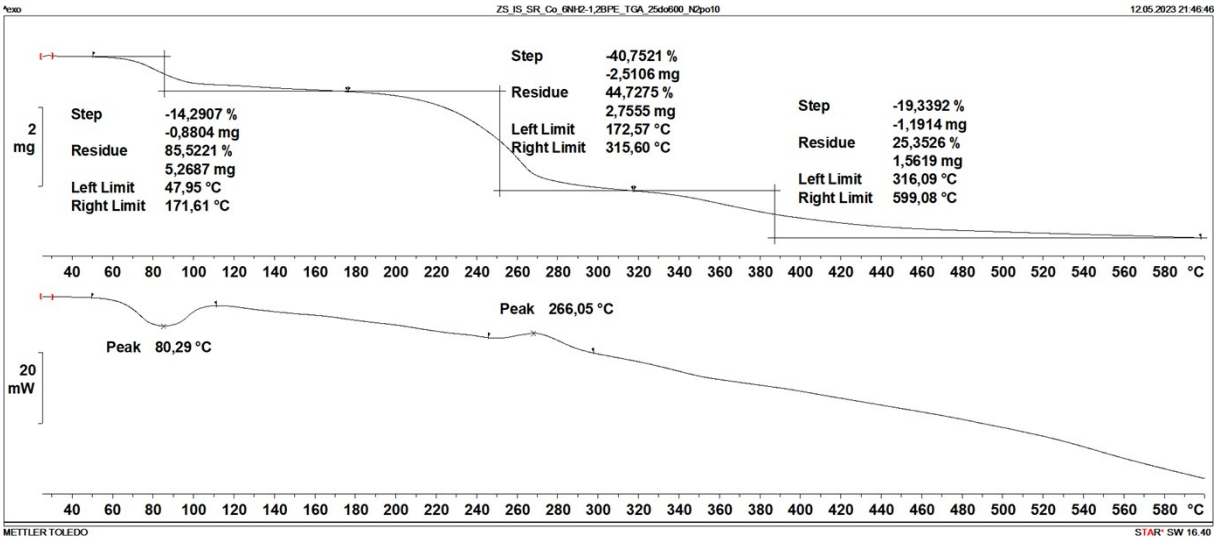

Figure S2. TGA/DSC curves of $\{[Co(1,2\text{-bpe})_2(H_2O)_2](6\text{-}NH_2nic)(NO_3)\cdot 4H_2O\}_n$ (**1**).

4. Electrochemical measurements

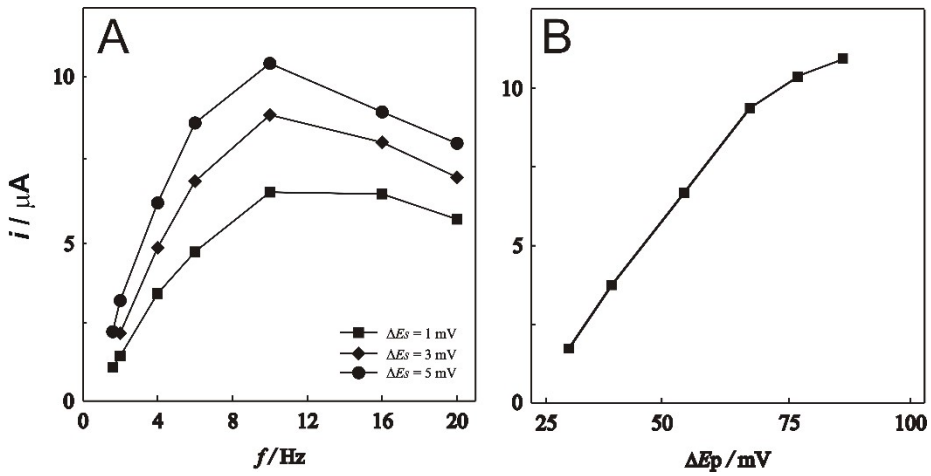

Figure S3. Effect of the electrochemical parameters on peak current for SWV on GCE|**1** electrode in 0.1 mol dm^{-3} solution of KCl (pH 6.0) containing 0.1 mM of dopamine: (A) frequency (*f*) with different potential increment (ΔE_s); (B) pulse height (ΔE_p).

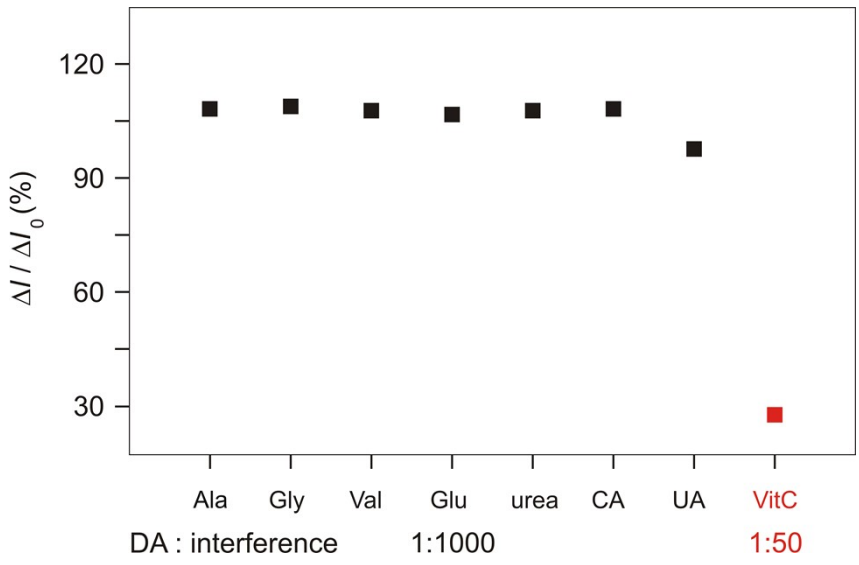

Figure S4. The relationship of interference current response ($\triangle I$) relative to DA current response ($\triangle I_0$).