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Supplementary Materials

A New Electrochemical Sensor for the Simultaneous Detection of Morphine and Methadone based on Thioglycolic Acid Decorated CdSe Doped Graphene Oxide Multilayers

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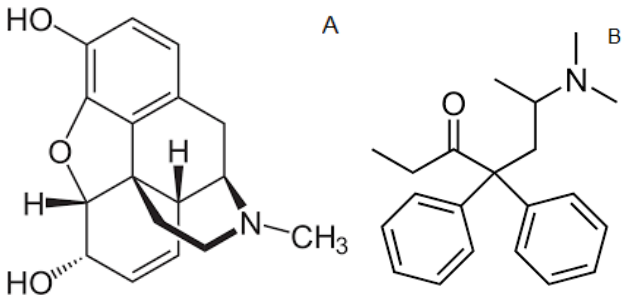

Figure S1. Chemical Structural of (A) Morphine, (B) Methadone

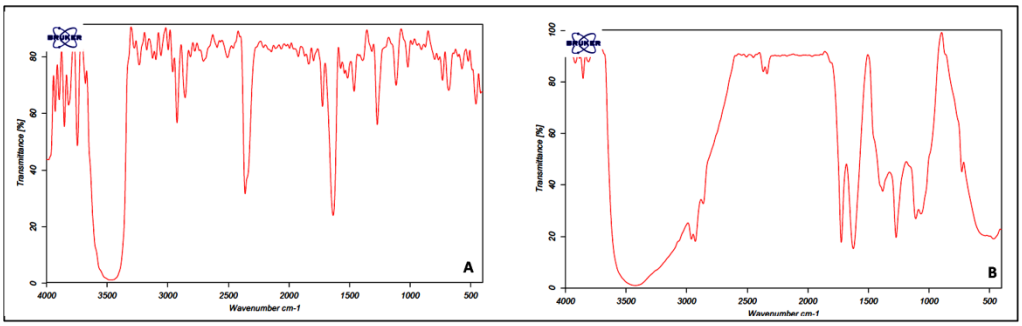

Figure S2. FT-IR spectra of (A) graphite oxide, (B) graphene oxide

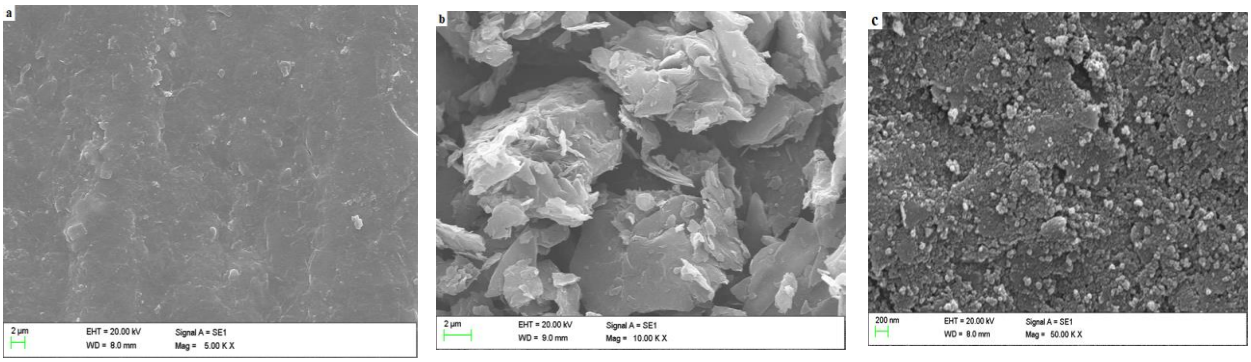

Figure S3. a) SEM images of Bare PGE; b) SEM images of Graphene oxide powder; c) SEM images of CdSe QDs powder

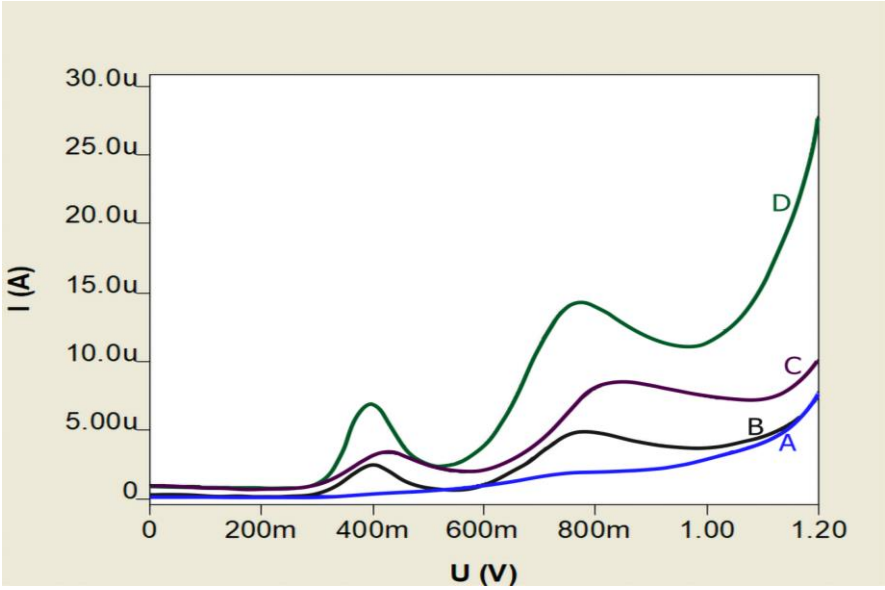

Figure S4. Differential pulse voltammetry response (A) Blank, (B) PGE, (C) Graphene oxide PGE, and (D) GO/ PGE / CdSe / modified electrode at 10 µM concentration of methadone and 10 µM of morphine at the presence of 0.1 M Silane phosphate buffer (pH = 7) , scan rate 0.25 MV^{-1}

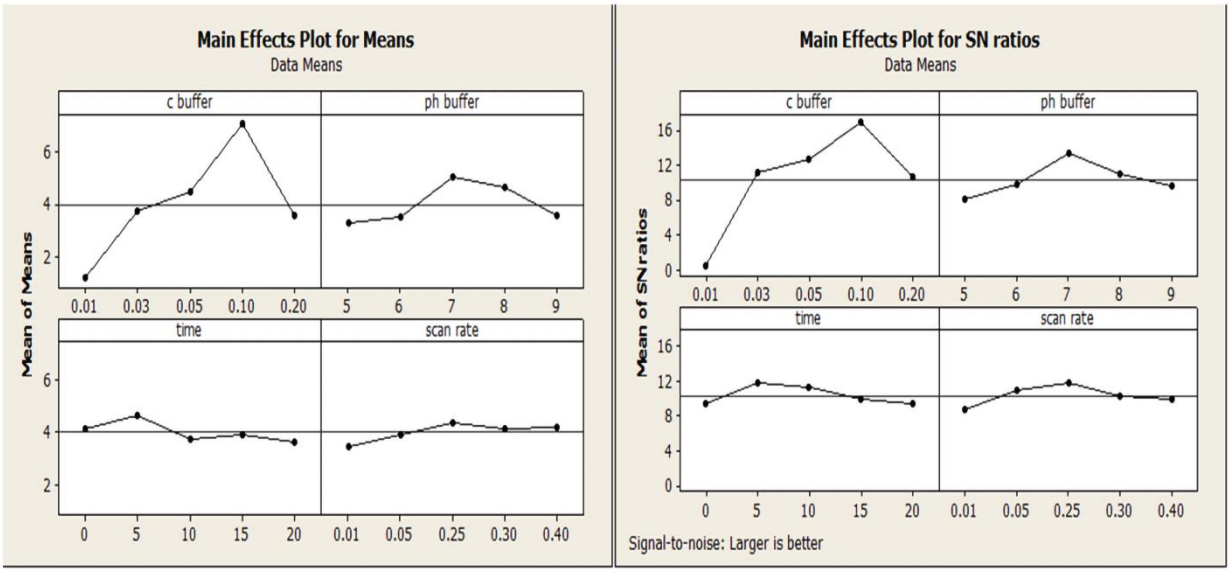

Figure S5. Results of Taguchi analysis of morphine and methadone

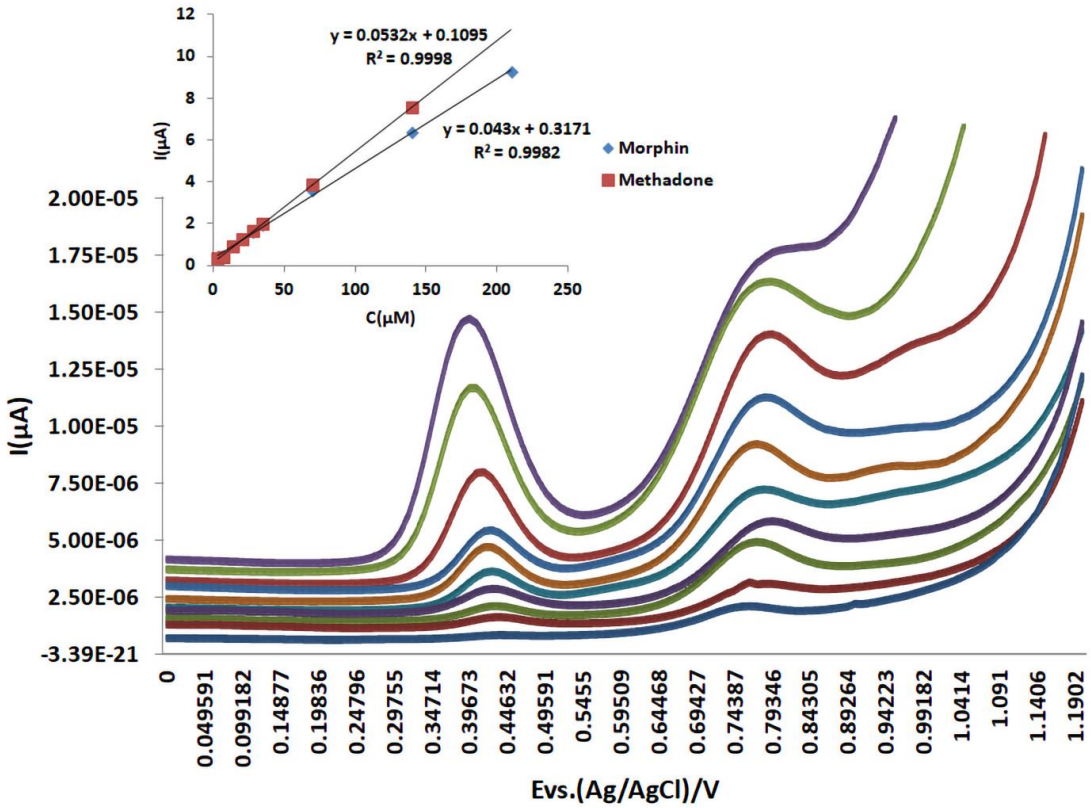

Figure 2. DP voltammogram obtained from the measurement of methadone, and morphine with a GO/ PGE / CdSe / modified electrode in Silane phosphate buffer (pH = 7), scan rate 0.25 MV^{-1}, at concentrations: 0.1, 0.5, 1.2, 3,4,5,6,8,10,15,20,40,60,80,100 µg.mL^{-1}

Table S1. The elements obtained in the EDS analysis

Element	Weight%	Atomic%
O K	5.59	20.55
Na K	4.63	11.85
S K	12.89	23.67
Se L	16.44	12.26
Cd L	60.45	31.66
Totals	**100.00**	

Table S2. Factors and their optimized values

Factors	Factors value						Optimized value
Deposition Time(hour)	2	4	6	8	12	17	6
Graphene oxide (gr)	0.00001	0.0001	0.0002	0.0005	0.002	0.01	0.002
CdSe(gr)	0.00001	0.0001	0.0002	0.0005	0.002	0.01	0.002

a Acetate buffer

b Robinson buffer

c Phosphate buffer

d Phosphate buffered Saline