Supporting Information

Sensitivity improvement by Langmuir film formation on a spectroelectrochemical fiber-optic sensor surface

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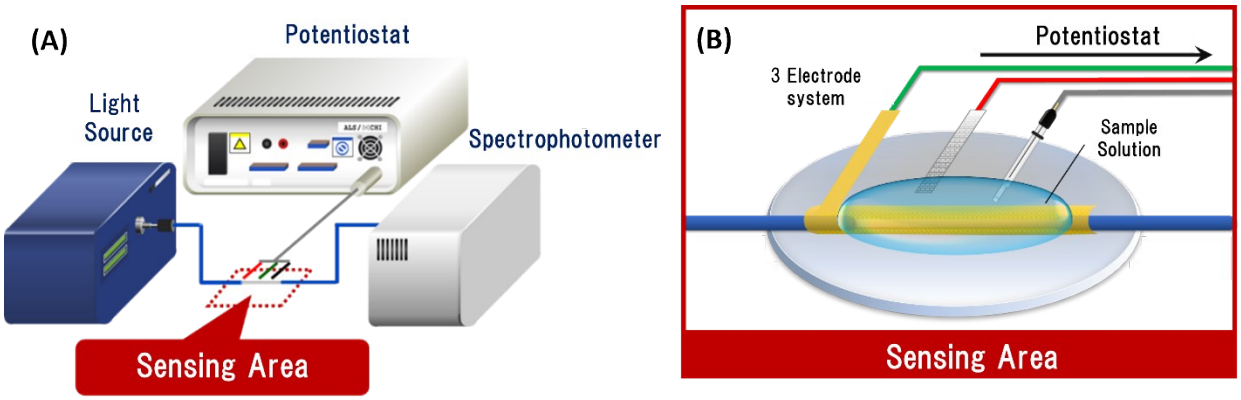

Figure S1. Schematic representation of the spectroelectrochemical experimental setup. (A) Instrument configuration showing the light source, spectrophotometer, and potentiostat connected to the sensing area. (B) Detailed view of the sensing area.

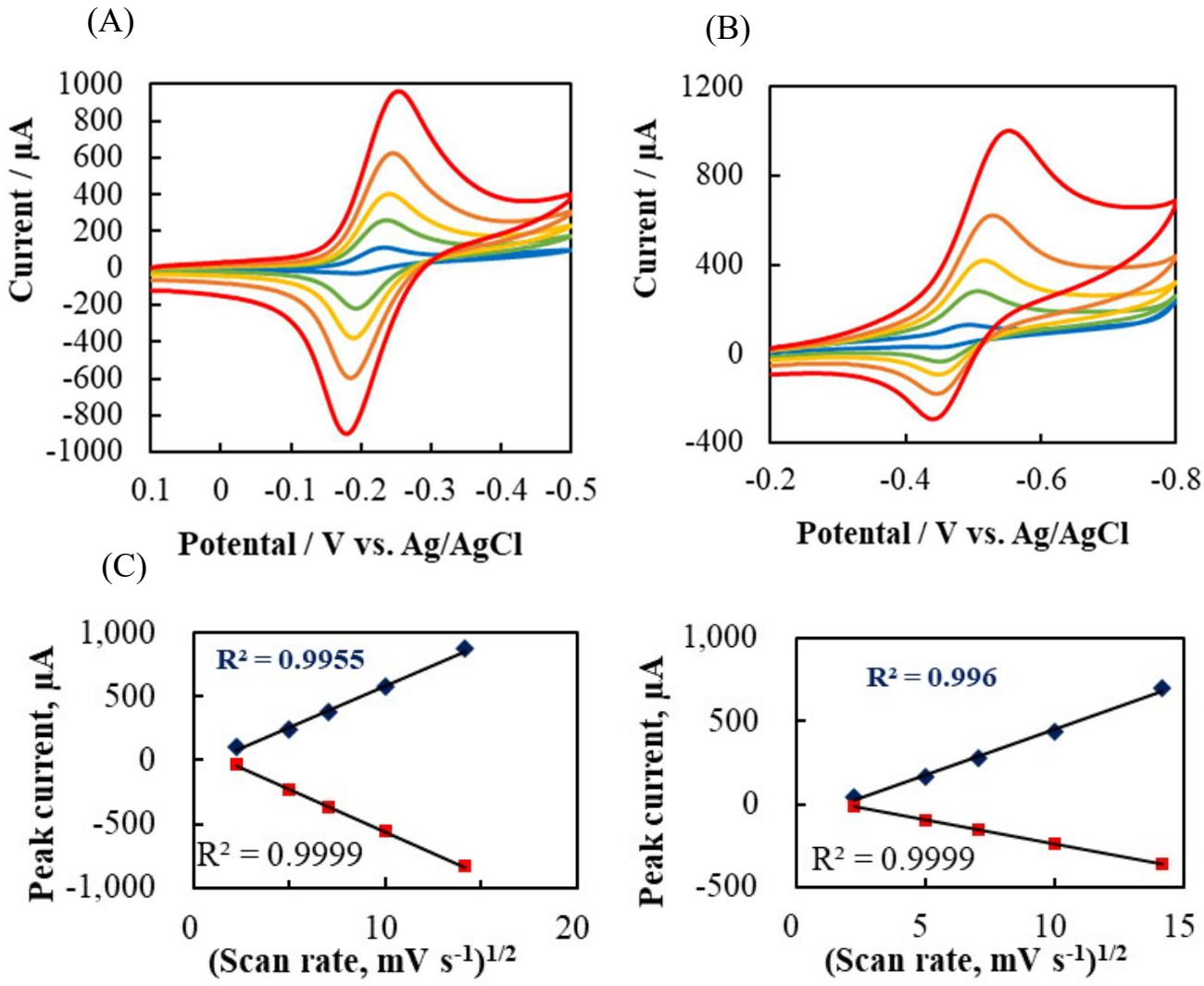

Figure S2. Cyclic voltammograms of (A) 100 µM methylene blue and (B) 100 µM phenosafranine using the gold mesh-covered fiber optic sensor at a different scan rate. (C) The plots of the current vs. square root of scan rate for 100 µM methylene blue and 100 µM phenosafranine.

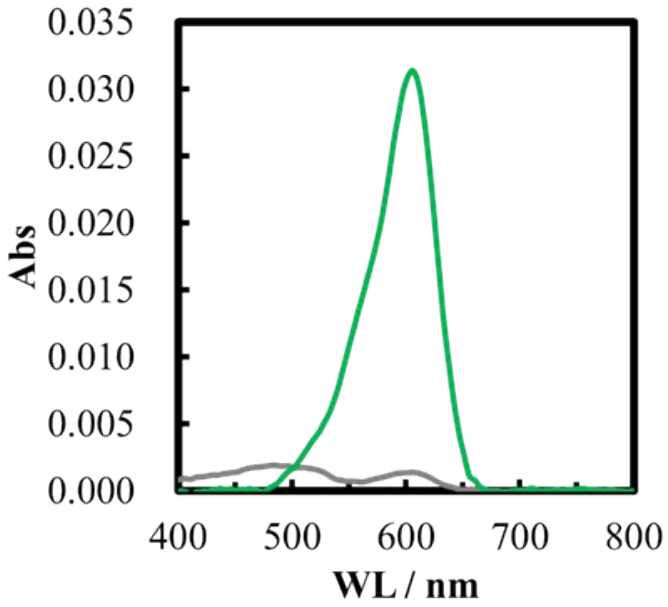

Figure S3. Absorption spectra of 50 μM indigo sulfonate in 0.1 M PBS (pH = 7.0) including 0.1 mM CTA^+ (Green line). The measurements were perfumed using the fiber-optic ATR method. Gray line shows control.

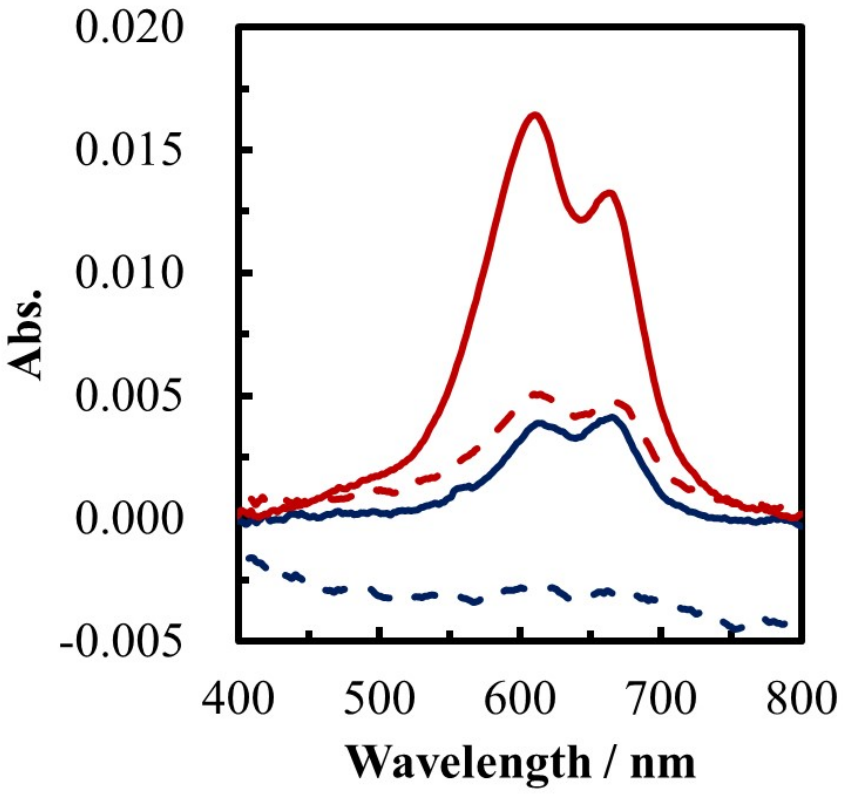

Figure S4. Absorption spectra obtained from 25 μM (red line) and 3 μM (blue line) sulfide ion using the electrochemical fiber optic sensor (dotted lines are controls).

Table S1. Summary of absorbance enhancement for 24 dyes upon surfactant addition.

No	Dyes	Charge	C / μM	(FT200UMT, bare)		0.41 M SDS add		0.10 M CTAB add		Ratio A/A_0
				λmax	A_0	λmax	A	λmax	A	
1	Thionine Acetate	1	100	610 nm	0.003	610 nm	0.004			1.12
2	New Methylene Blue	1	10	570 nm	0.010	585 nm	0.011			1.06
3	Methylene Blue	1	10	605 nm	0.006	600 nm	0.034			5.81
4	Methyl Violet B	1	10	540 nm	0.010	550 nm	0.039			4.00
5	Ethyl Violet	1	10	520 nm	0.097	545 nm	0.077			0.80
6	Rhodamine B	1	100	555 nm	0.018	555 nm	0.039			2.17
7	Rhodamine 6GX	1	100	500 nm	0.018	505 nm	0.051			2.75
8	Fenosafranin	1	100	520 nm	0.006	510 nm	0.016			2.79
9	Methyl Orange	-1	100	450 nm	0.001			380 nm	0.084	64.50
10	Ethyl Orange	-1	100	435 nm	0.004			395 nm	0.167	38.60
11	Alizarine Violet	-1	100	500 nm	0.002			535 nm	0.016	8.16
12	Alizarine Red	-1	100	515 nm	0.001			545 nm	0.007	5.92
13	Orange I	-1	100	465 nm	0.001			470 nm	0.042	37.23
14	Orange II	-1	100	515 nm	0.013			485 nm	0.033	2.51
15	Phenol Red	-1	100	435 nm	0.002			435 nm	0.041	21.57
16	Thimol Blue	-1	100	455 nm	0.004			450 nm	0.031	8.46
17	DCPIP	-1	100	555 nm	0.002			635 nm	0.049	20.29
18	Nucler Fast Red	0	100	520 nm	0.002			505 nm	0.002	1.31
19	Indigo Sulfonate	-2	100	605 nm	0.001			605 nm	0.031	22.67
20	Bromocresol Purple	-2	100	405 nm	0.007			605 nm	0.071	10.45
21	Bromocresol Green	-2	100	625 nm	0.015			625 nm	0.016	1.02
22	Bromophenol Blue	-2	100	605 nm	0.010			610 nm	0.050	5.07
23	Bromothymol Blue	-2	100	425 nm	0.007			430 nm	0.020	2.98
24	Sulfonazo III	-4	100	485 nm	0.002			485 nm	0.019	9.21