

Supporting information

Photochemically-made Gold Nanorods for Adsorption and SERS Detection of Cocaine and Benzoylecgonine in Latent Fingerprints

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Table S1. DLS/ELS values for NR samples.

NR sample	Hydrodynamic size (nm)	Zeta potential (mV)
NR1	45.48 ± 2.7	$+ 39.5 \pm 11.1$
NR2	37.62 ± 3.1	$+ 30.6 \pm 11.9$
NR3	37.24 ± 2.4	$+ 32.4 \pm 12.9$
NR4	37.50 ± 3.2	$+ 33.4 \pm 10.1$

Table S2. Band assignment of R6G SERS spectra.

Wavenumber (cm ⁻¹)	Assignment [1]
225	Ag-Cl and Ag-R6G stretching
312	XRT
353	XRT
403	XRD
567	EGM
610	XRP
765	XRD
1086	EGM
1125	EGM
1178	EGM
1310	aromatic C-C bending
1361	XRS
1510	aromatic C-H bending
1571	XRS
1648	aromatic C=C stretching

XRT: xanthene ring torsion; XRD: xanthene ring deformation; EGM: external group mode; XRP: xanthene ring puckering; XRS: xanthene ring stretching

[1] Majoube, M. and Henry, M. *Spectrochim. Acta* **1991**, 46A, 1459-1466.

Table S3. Band assignment of COC powder, COC and BENZ Raman/SERS spectra.

Wavenumber (cm ⁻¹)			Assignment [2-4]
COC (powder) ^a	COC ^b	BENZ ^b	
786	784	771	C-C stretching (piperidine ring)
871	853	-	C-C stretching (tropane ring)
896	887	885	C-C stretching (tropane ring)
1001	1002	1007	aromatic ring breathing
1021	1026	1023	C-N ⁺ stretching
1163	1161	1163	C-N stretching
1276	1273	1292	C-N stretching
1313	1312	-	C-H twisting
1599	1599	1601	C=C stretching
-	-	1687	C=O stretching (benzoyl ring)
1716	1719	1713	C=O stretching

a: Raman spectrum; b: SERS spectrum

[2] Esam, M. A. et al. *Anal. Bioanal. Chem.* **2008**, 390, 159–1166.

[3] Inscore, F. et al. *Appl. Spectrosc.* **2011**, 65, 1004-1008.

[4] Farquharson, S. et al. *Front. Chem.* **2019**, 7, 706

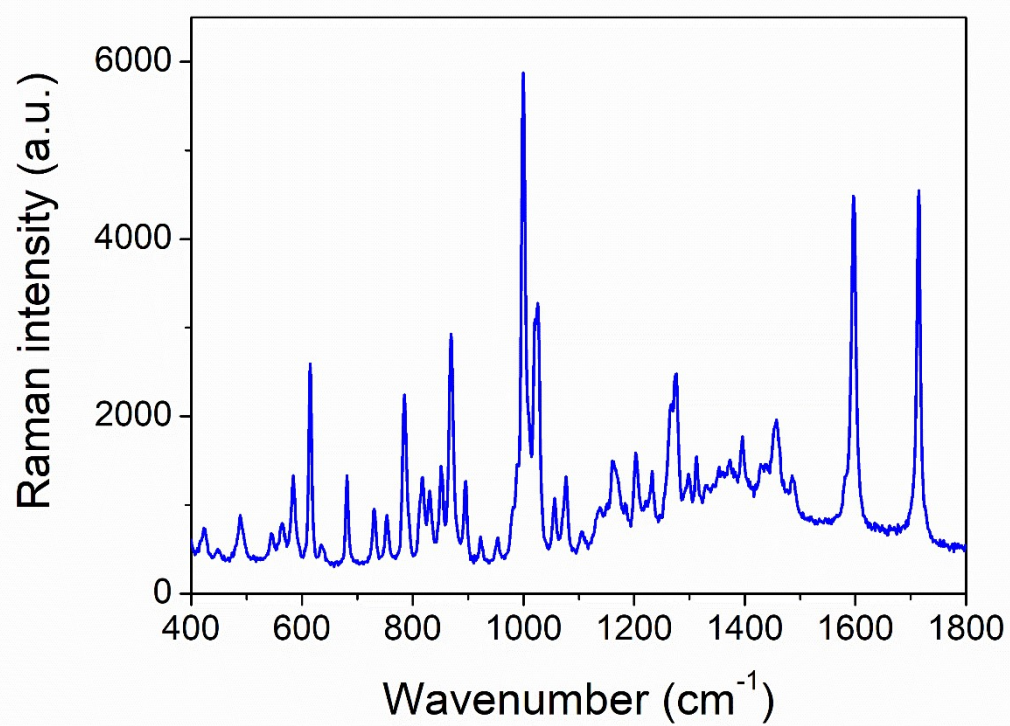


Figure S1. Raman spectrum of powder cocaine.