Supporting information

Highly Porous Gold Supraparticles as Surface-enhanced Raman Spectroscopy (SERS) Substrates for Sensitive Detection of Environmental Contaminants

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Keywords: *Supraparticles, surface-enhanced Raman spectroscopy (SERS), environmental contaminants, porosity, self-assembly,*

Total Pages: 5

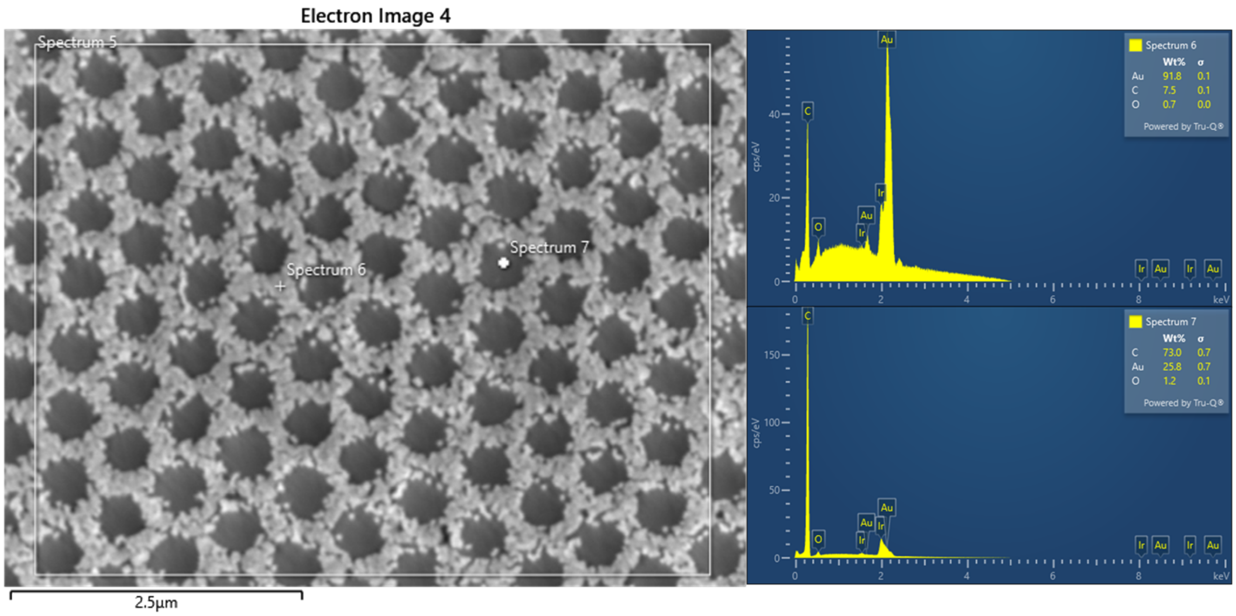

Figure S1. Energy dispersive spectroscopy (EDS) spectra of the Au/PS supraparticle from two different positions; a polystyrene (PS) nanoparticle and Au nanoparticle aggregates. The mass percent of Au and C, a representative of PS from EDS spectra.

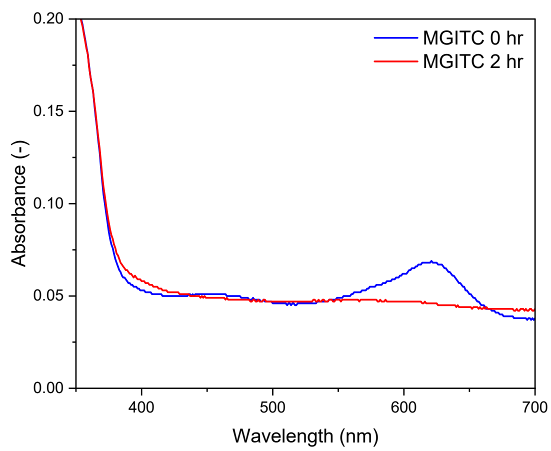

Figure S2. Absorbance spectra of MGITC solution before and after 2 hrs of contact with the porous Au supraparticle.

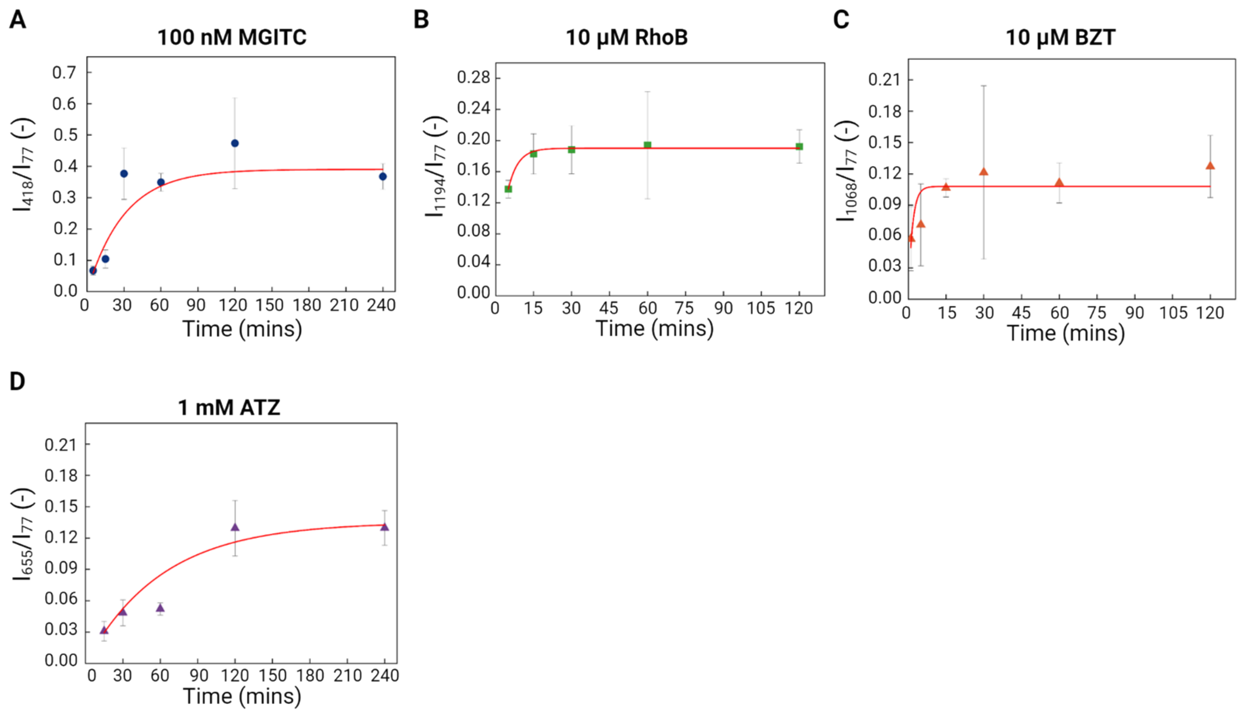

Figure S3. (A)-(D) Sorption kinetics of environmental contaminants (100 nM MGITC, 10 µM RhoB, 10 µM BZT, 1 mM ATZ) based on the Raman intensity increases of their characteristic peaks with time. The symbols and error bars indicate the means and standard deviation of the normalized Raman signals from the 400 SERS spectra.

Table S1. Gene sequences for *int*I1

	5'- sequences -3'
*int*I1	GTGCACGGGCATGGTGGCTGAAGGACCAGGCCGAGGGCCGCA GCGGCGTTGCGCTTCCCGACGCCCTTGAGCGGAAGTATCCGCGC

Table S2. SERS peaks and corresponding assignments

Wavenumber (cm^{-1})	Assignments	ref
MGITC		
418	Out-of-plane benzene ring deformation	1
1171	In-plane benzene υ_9 mode	2
1364	The aromatic ring stretching mode	2
1388	In-plane C−C/C−H stretch	3
RhoB		
1194	C−C bridge band stretching	4
1279	Aromatic C−H bending aromatic	4
1506	Aromatic C−C bending	5
BZT		
419	C−S stretching, C−C−C ring bending (ring breathing)	6
994	C−H ring bending	6
1021	C−C−C bending and C−S stretching	6
1068	C−C−C bending and C−S stretching	6
ATZ		
655	Asymmetric deformation N–C–N/C–N–C and ring breathing	7
961	Asymmetric deformation N–C–N/C–N–C and ring breathing	7
Gene segment		
730	Adenine	8
959	Deoxyribose	9
1315	Guanine	10
1335	Adenine	8
1458	Deoxyribose	10

Table S3. The composition of wastewater influent

pH	Na^+	Mg^{2+}	Si^{4+}	P^+	K^+	Ca^+
	(mg/L)					
6.51	158.27 ± 5.01	6.58 ± 0.37	8.06 ± 0.70	6.10 ± 0.30	16.67 ± 0.27	12.38 ± 0.41
Specific Conductivity (µS/cm)	F^-	Cl^-	NO^{2-}	PO_4^{3-}	SO_4^{2-}	Br^-
	(mg/L)					
1172.0	0.10 ± 0.01	135.39 ± 0.02	0.35 ± 0.02	5.74 ± 0.08	21.76 ± 0.28	0.12 ± 0.00
Total organic carbon (TOC, mg/L)						
5.38						

The cation and anion compositions were analyzed by using inductively-coupled plasma-mass spectrometer (ICP-MS) and ion chromatography (IC). The sample was filtered through 0.45 µm polytetrafluoroethylene (PTFE) filter.

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