Supporting Information

Wetting Properties and SERS Applications of ZnO/Ag Nanowire Arrays Patterned by Screen-Printing Method

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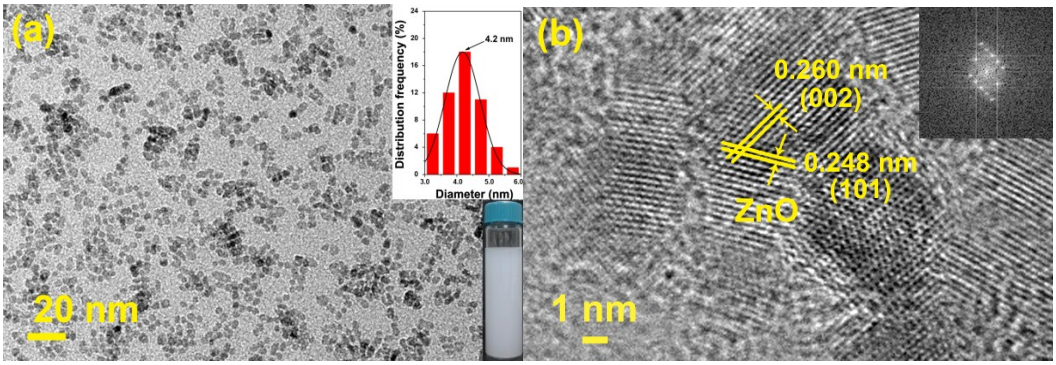

Fig. S1 The TEM image of ZnO NPs, the insert are the photograph of ZnO NPs and alcohol dispersion system and the corresponding histogram of particle size distributions (a); the HRTEM image of ZnO NPs (b).

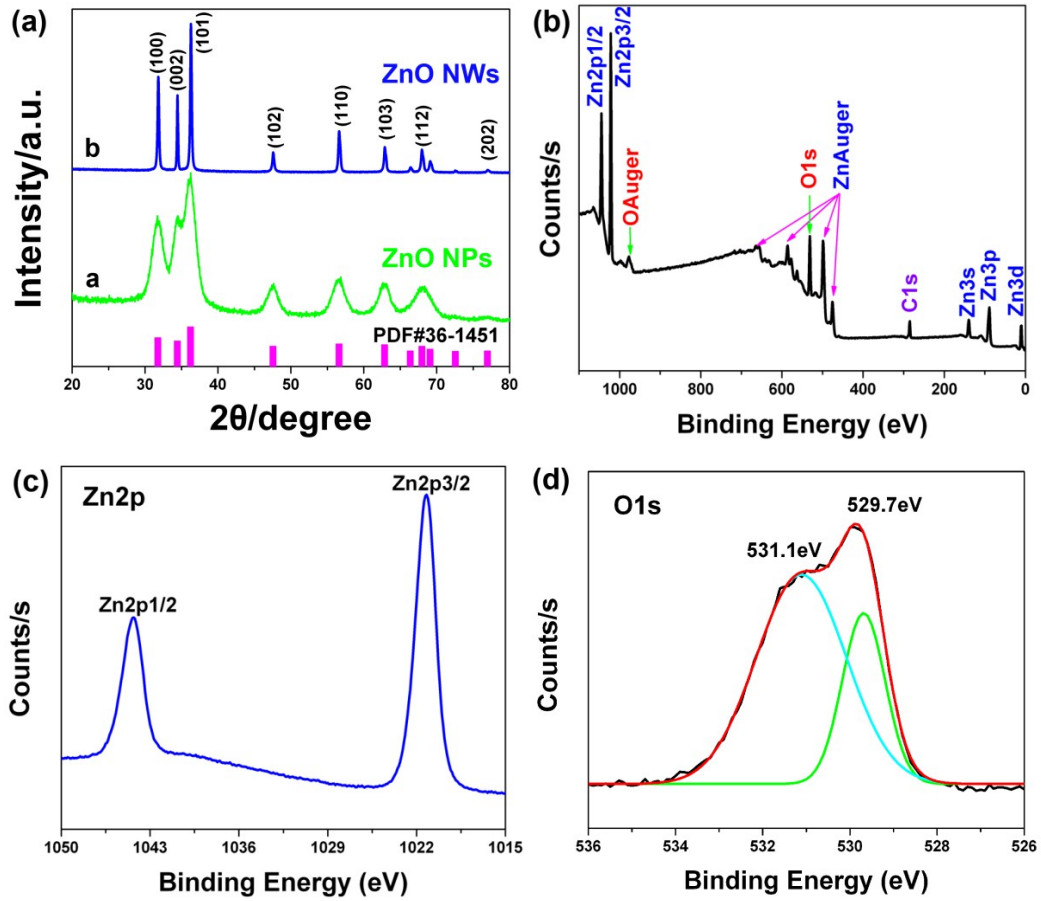

Fig. S2 XRD pattern of ZnO NPs (curve a) and the as-obtained ZnO Nanowires (curve b), together with standard JCPDS card (36-1451, pink lines, a); XPS wide survey spectra of ZnO Nanowires obtained by hydrothermal method (b); and XPS spectra of the zinc Zn 2p peaks (c) and oxygen O 1s peaks (d).

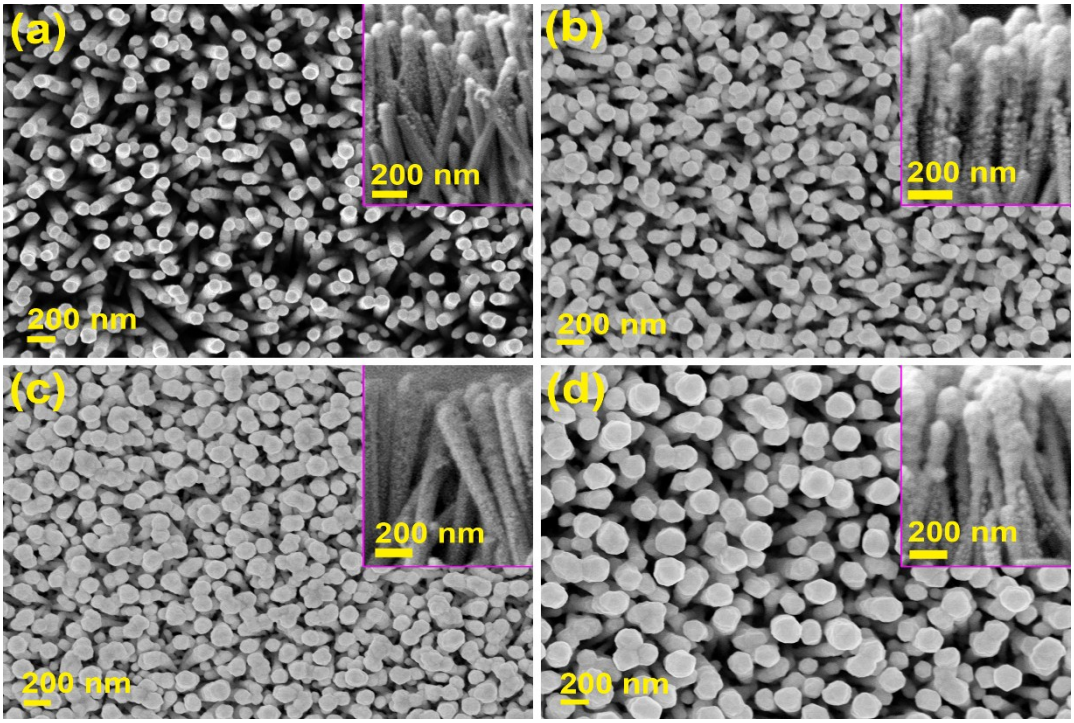

Fig. S3 The SEM images of ZnO/Ag NWs arrays prepared on PET with a sputtering duration of 3 min (a), 6 min (b), 9 min (c) and 15 min (d); and the insets show their corresponding cross-sectional SEM images, respectively.

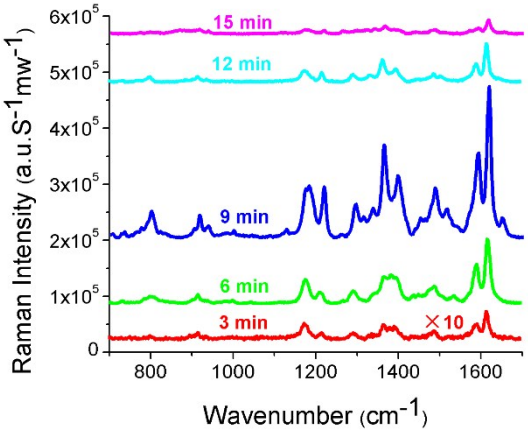

Fig. S4 The SERS spectra collected on ZnO/Ag NWs arrays prepared on PET with different sputtering durations (3 min, 6 min, 9 min, 12 min and 15 min) after being immersed in 10^{-5} M MG solution.

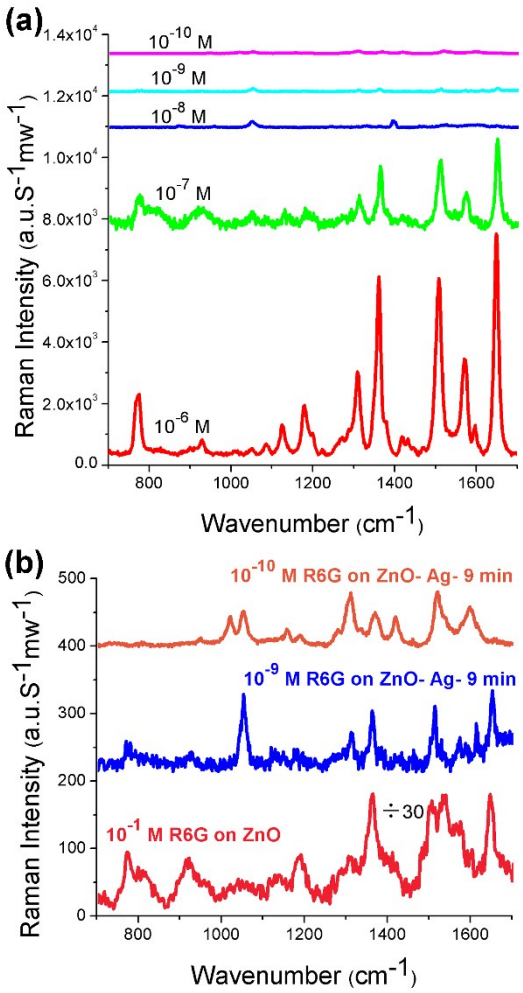

Fig. S5 The SERS spectra of R6G collected on the ZnO/Ag NWs arrays prepared on PET with a sputtering duration of 9 min, which was exposed to different R6G concentrations (from 10^{-6} to 10^{-10} M, left); right, the enlarged SERS spectra of R6G collected on the above substrate exposed to 10^{-9} and 10^{-10} R6G solution, and the Raman spectra of R6G collected on the patterned ZnO NWs arrays prepared on PET without Ag sputtering exposed to 10^{-1} M R6G solution.

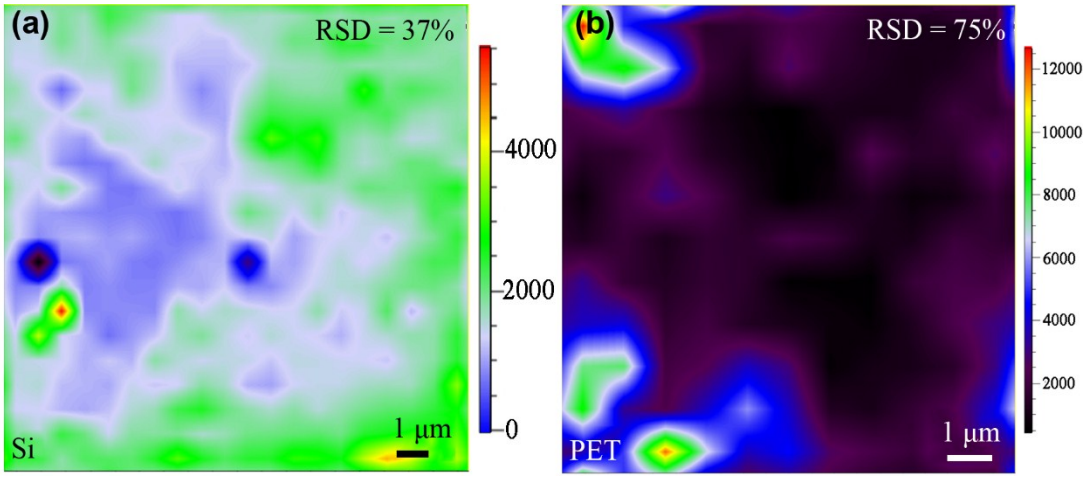

Fig. S6 Two Raman mappings of randomly selected areas on 3D ZnO/Ag-9 substrates on Si and PET, respectively.

Table S1 Reported detection limits and enhancement factors on some noble metal/semiconductor and printed SERS substrates

substrate	Raman molecules	detection limit	enhancement factor	Ref.
Ag NPs decorated TiO_2 NRs	MG	10^{-12}	4.36×10^5	1
Ag NCs on ZnO NDAs	MG	10^{-17}	1×10^6	2
Ag- decorated ZnO NPAs	R6G	10^{-7}	1×10^6	3
Au Semishells decorated TiO_2 Sphere arrays	R6G	-	1.4×10^5	4
Screen printed Ag NPs	R6G	10^{-12}	4.4×10^6	5
Screen printed Au–Ag bimetallic microfluidic	R6G	1.1×10^{-13}	4.4×10^6	6
ZnO/Ag NWAs patterned by screen-printing	**MG**	$\mathbf{10^{-12}}$	$\mathbf{2.5\times10^{10}}$	**this study**
	R6G	$\mathbf{10^{-10}}$	$\mathbf{1.6\times10^7}$	

NR: nanorod, NC: anocluster, NDA: nanodome array, NPA: nanoplate array, NSA: nanosphere array, NWA: nanowire array

Reference:

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