

# Supporting Information

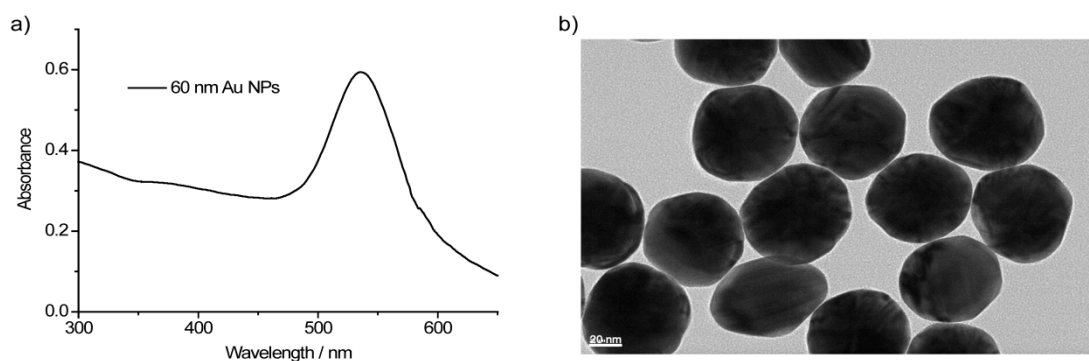
## **Real-time sensing of o-phenylenediamine oxidation on gold nanoparticles**

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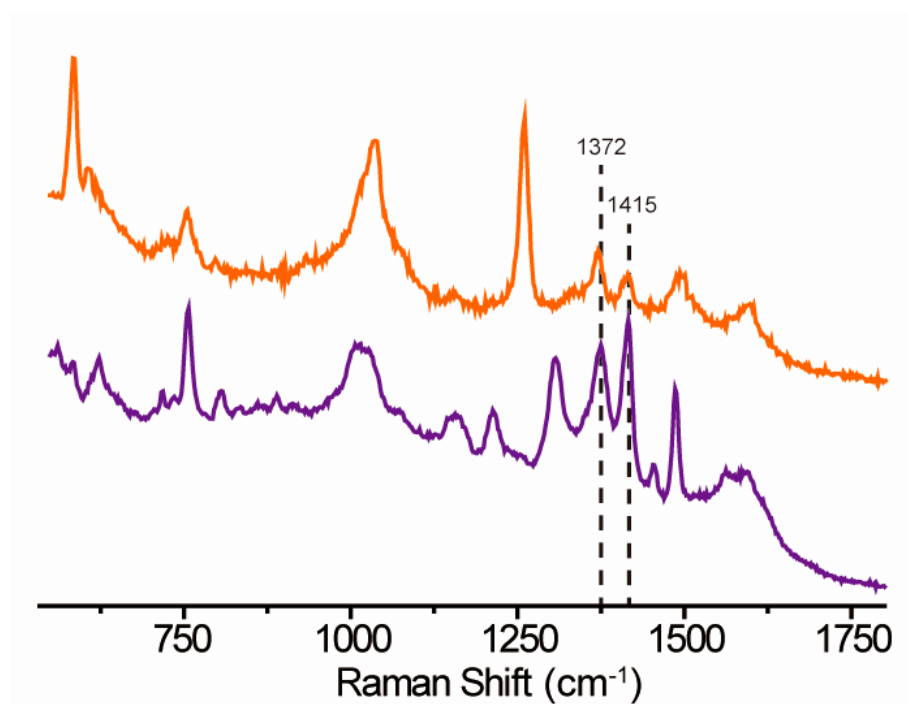
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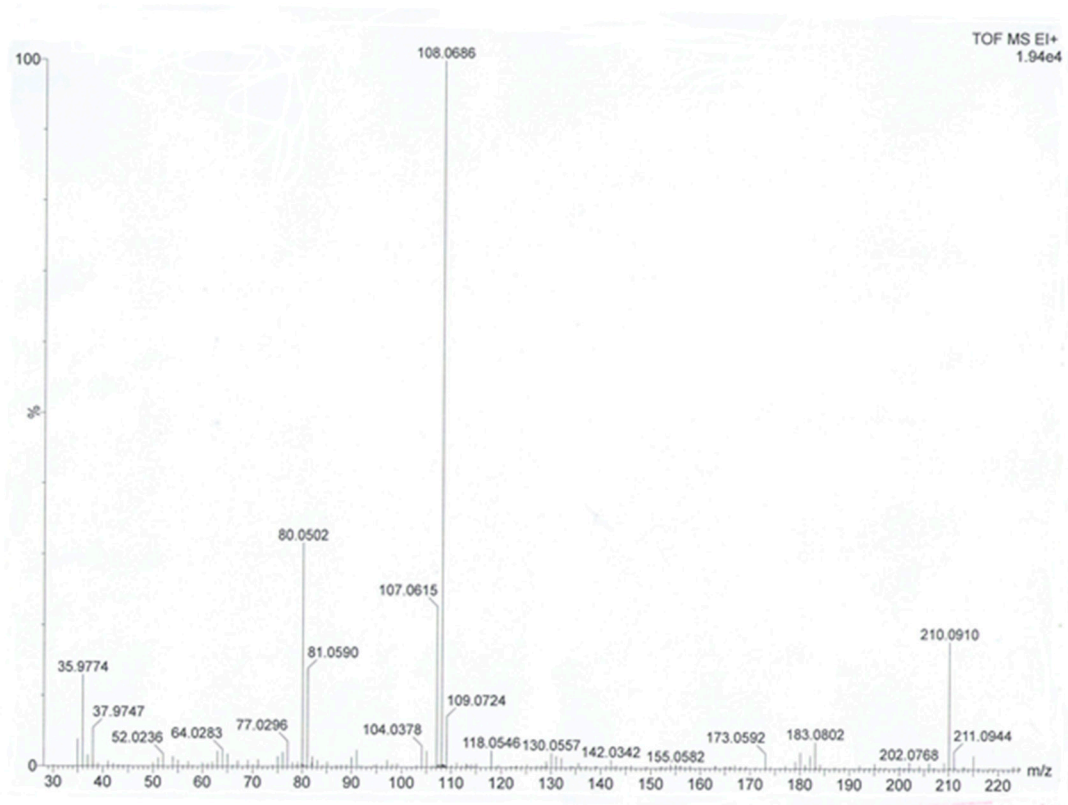
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**Figure S1.** UV-Vis spectra (a) and transmission electron microscope image (b) of the synthesized gold nanoparticles with a diameter of 60 nm.



**Figure S2.** SERS spectra of pure 2,3-diaminophenazine solution (purple) and AuNPs/OPD+ $\text{Cu}^{2+}$  incubated at 37 °C for 30 min (orange).



**Figure S3.** Mass spectrum (HREI<sup>+</sup>) of Au NPs/OPD+Cu<sup>2+</sup> incubated at 37 °C for 30 min.

**Table S1.** SERS Spectral data of AuNPs/OPD before and after reaction with Cu<sup>2+</sup> and Raman spectral data calculated with DFT for OPD and OPDox corresponding band assignments.

OPD			OPDox		
Theory (cm <sup>-1</sup> )	Experimental (cm <sup>-1</sup> )	Assignment	Theory (cm <sup>-1</sup> )	Experimental (cm <sup>-1</sup> )	Assignment
592	585	$\rho$ CCC ring	586	585	$\rho$ CCC ring
760	753	$\nu$ CC ring, $\nu$ C-NH <sub>2</sub>	752	753	$\nu$ CC ring, $\nu$ C-NH <sub>2</sub>
1055	1037	$\nu$ CC ring, $\delta$ CCH ring	1034	1037	$\nu$ CC ring, $\delta$ CCH ring
1257	1262	$\delta$ CCH ring, $\nu$ CC ring, $\nu$ C-NH <sub>2</sub>	1262	1262	$\delta$ CCH ring, $\nu$ CC ring, $\nu$ C-NH <sub>2</sub>
1512	1500	$\nu$ CCC ring, $\delta$ CCH ring,	1372	1372	$\nu$ C-N=C, $\nu$ CC ring

		$\nu$ C-NH <sub>2</sub> , $\rho$ NH <sub>2</sub>			
1592	1600	$\nu$ CCC ring, $\delta$ CCH ring, $\rho$ NH <sub>2</sub>	1413	1415	$\delta$ C-N=C
			1499	1500	$\nu$ CCC ring, $\delta$ CCH ring, $\nu$ C-NH <sub>2</sub> , $\rho$ NH <sub>2</sub>
			1601	1600	$\nu$ CCC ring, $\delta$ CCH ring, $\rho$ NH <sub>2</sub>

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$\nu$ , stretching;  $\delta$ , in-plane bending;  $\rho$ , scissoring