Supporting information

Reliable SERS Detection of Nitrite based on pH and Laser Irradiance-dependent Diazotization through a Convenient Sampling Micro-chamber

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Fig. S1 SEM images of different distal tips (a-e) and its inner surface of micro-chambers morphology (f-j) with different sizes of orifice: (a) 25, (b) 100, (c) 200, (d) 300, (e) 500 μm. Scale bars: (a-e) 100 μm, (f-j) 200 nm.
Fig. S2 SEM image of 50 nm Au NPs

Fig. S3 UV-vis absorption spectrum of 50±5 nm gold collides.

Fig. S4 SERS spectra of PATP reacted with 100 μM NO$_2^-$ ions based in the different micro-chambers (normalized Raman band at 1141 cm$^{-1}$ to the peak intensity at 1078 cm$^{-1}$; laser power 1.75 mW and pH=1).
**Fig. S5** The intensity of SERS band at 1078 cm$^{-1}$ under different laser power illumination (pH=7)

**Fig. S6** The enlarged panel of the characteristic peaks at 1141 and 1182 cm$^{-1}$ of PATP-capped micro chambers reacted with 100 μM NO$_2$ under different conditions. (Power laser 1.75 mW)
Fig. S7 The ion chromatography of fermented bean curd (a) and picked vegetable (b), the SERS spectra of real samples. (c) The SERS spectra of NO$_2^-$ reacted with PATP-capped micro-chamber in real samples.

<table>
<thead>
<tr>
<th></th>
<th>C$_{SERS}$ measurement (μM)</th>
<th>C$_{IC}$ measurement (μM)</th>
<th>relative error</th>
<th>RSD</th>
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<tbody>
<tr>
<td>fermented bean curd</td>
<td>83.52</td>
<td>72.62</td>
<td>0.1501</td>
<td>0.2114</td>
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<tr>
<td>pickled vegetable</td>
<td>133.8</td>
<td>116.6</td>
<td>0.1475</td>
<td>0.1908</td>
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