

Supplementary Information

A Facile Iodination Approach for Preparing SERS Active Silver Substrates

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Sample preparation and Raman measurement:

The silver was prepared by two steps, including sputtering silver on a piece of silicon wafer by a Denton Explore #14, base pressure 5×10^{-7} Torr, operation DC current 150 mA at 0.005 Torr, protected by Argon gas and was cut into smaller size ($1.5 \times 2 \text{ cm}^2$) before use. The silver iodination was proceeded as follows: A piece of sputtered silver wafer was immersed in an iodine solution (0.1 mM of iodine in 15 mL of ethanol) for 4 minutes to achieve a homogeneous treatment. The wafer was rinsed several times with ethanol after this dipping step. The as-prepared silver substrate was cut into small pieces in order to perform SERS measurement at different time intervals.

We measured the UV-vis absorption spectroscopy on a Perkin-Elmer Lambda 900 UV/VIS/NIR double beam Spectrometer. Atomic force microscopy (AFM) tapping mode was used (NanoScope IIIa/Dimension 3100 (Digital Instruments)) to study the topology of the sample surface.

A Rhodamine 6G (R6G) aqueous solution (10^{-7} M) is used as the probe molecule to test the SERS performance for this silver substrate. A drop of the analyte solution is drop-cast onto the substrate and kept for about five minutes to ensure that a thin layer is adsorpted onto the substrate. SERS measurement was performed on a Renishaw micro-Raman 3000 system, equipped with a 514 nm argon laser. Laser was delivered to the sample via a 50 x ultra-long working distance objective (WD 8 mm and NA 0.55, Olympus); the power on sample was 0.01 mW. Each spectrum was accumulated for ten seconds only.