

SUPPORTING MATERIAL

Manipulating chemistry through nanoparticle morphology

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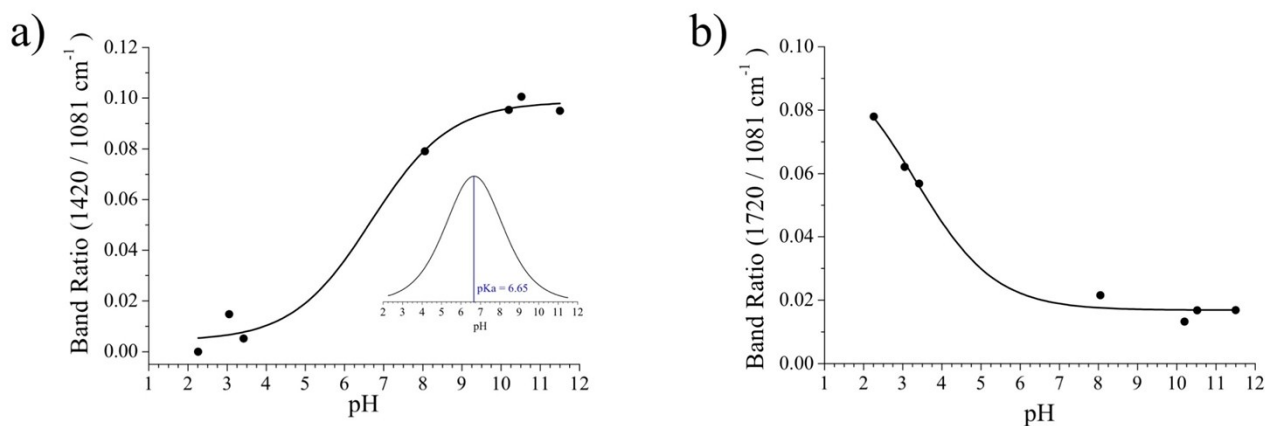


Figure S1. A separate aliquot of pristine gold nanostar solution is functionalized with MBA and dispersed at different *pH*s by adding small quantities of HCl or NaOH. SERS spectra are acquired at 785 nm and the relative intensities of 1423 (a) and 1720 cm⁻¹ (b) bands approximately follow the *pH* changes. Fitted curves represent analytical expressions from Jaworska *et al. Analyst* **2015**, *140*, 2321-2329. The inset in (a) represents the first derivative obtained from the curve, from which a pKa of 6.65 can be estimated.

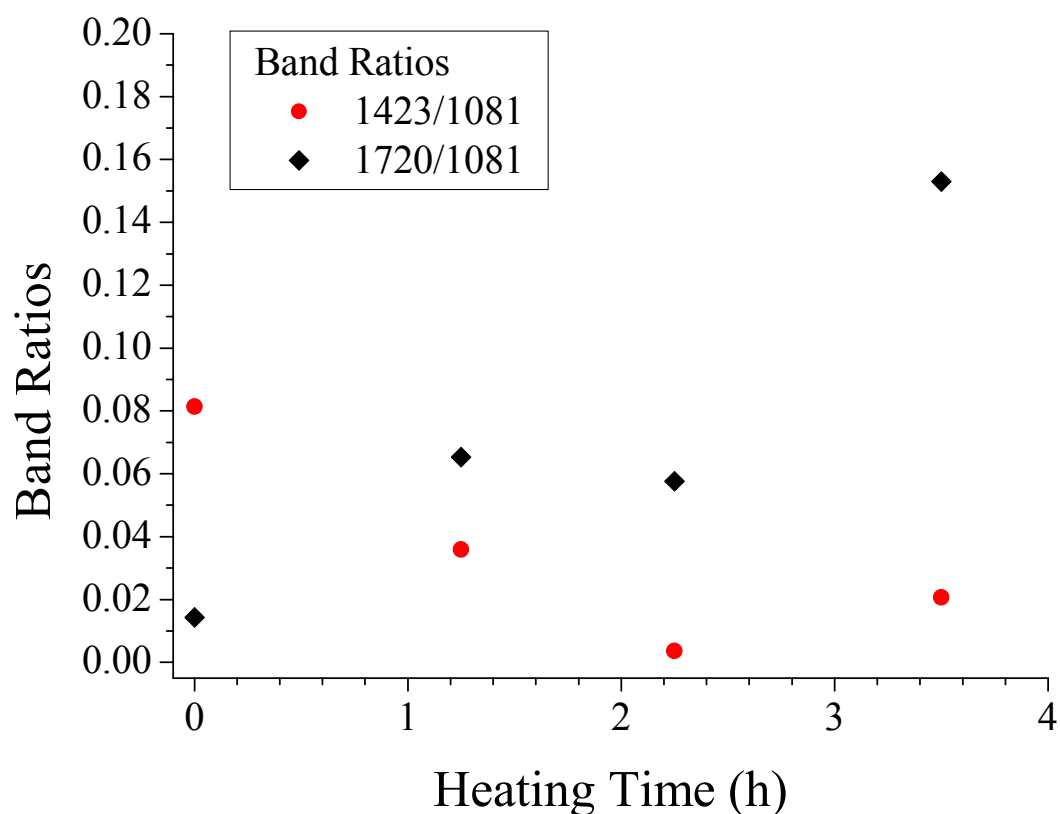


Figure S2. SERS band ratios for MBA functionalized gold nanostars stabilized with polyethylene glycol and thermally reshaped. The relative band trends resemble the one of gold nanostars stabilized with PVP.

Table S1. Main SERS peak assignments for MBA and ABT.

Frequency, cm^{-1}	Attribution	Reference
MBA		
1082	C-S stretc.	1, 2, 3
1423	COO^- stretc.	1, 2, 3
1720	COOH stretc.	1, 2, 3
ABT		
1082	C-C + C-S stretc.	4
1180	C-H bend. (a1 mode)	4
1420	C-C stretc. + C-H bend. (b2 mode) only found in neutral ABT	4

1. A. Jaworska et al. *Analyst* 140(7) (2015) 2321-2329
2. A. Pallaoro et al. *Small* 6(5) (2010) 618-622
3. Y. Liu et al. *Journal of Raman Spectroscopy* 44(7) (2013) 980-986
4. D.-Y. Wu et al. *The Journal of Physical Chemistry C* 113(42) (2009) 18212-18222

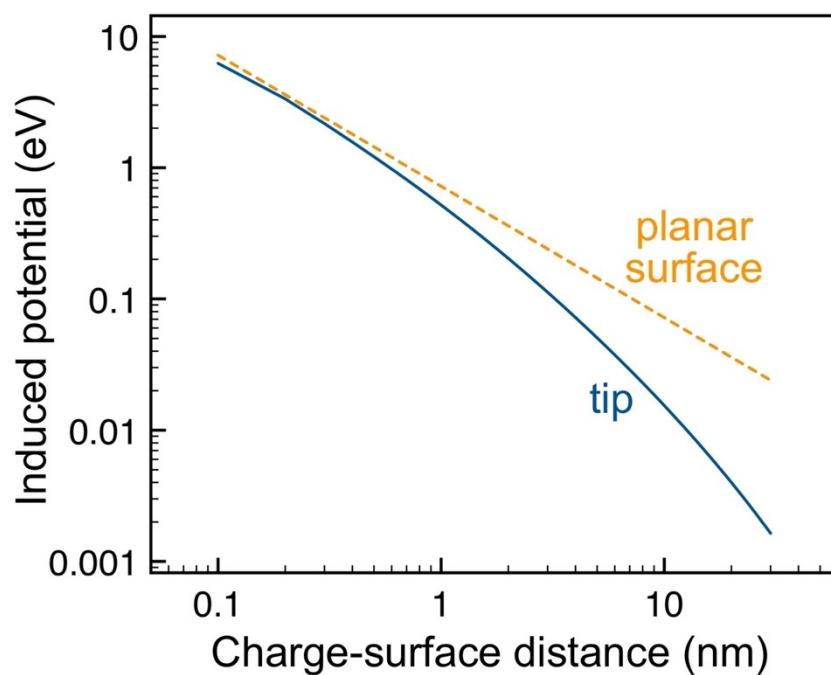


Figure S3. Induced potential at the position of a point charge (self-induced potential energy) as a function of distance to a planar gold surface or a gold sharp tip. The potential is multiplied by -1. The image potential is half of this value. We take the tip to have 2 nm radius at the apex, with 20 nm elongation, 20° half-aperture angle, and emerging from a sphere of 40 nm diameter.