Electronic Supplementary Material (ESI) for RSC Advances.

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Colloidal lenses as universal Raman scattering enhancers

SUPPORTING INFORMATION

SI 1. Optical microscope images of SiO_2 spheres on TiO_2 thin films: example of sampling procedure

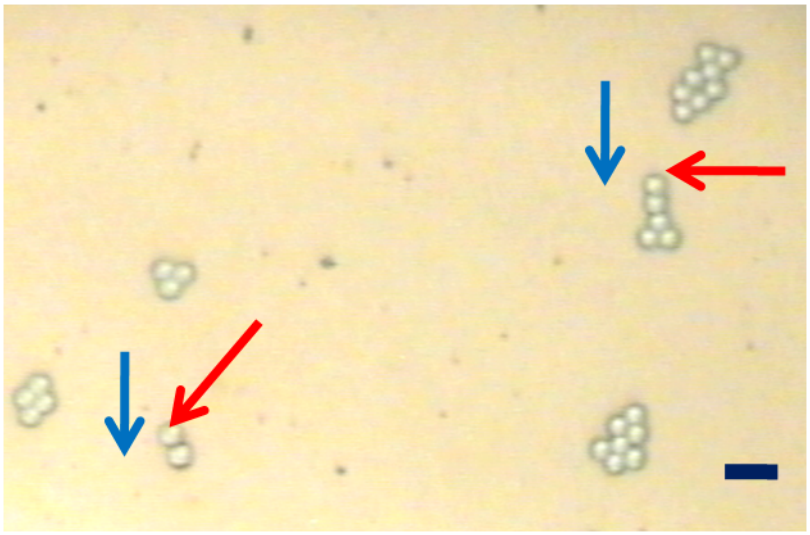

Figure S1. Example of SiO_2 microspheres drop-casted onto a single-crystal Si substrate coated with anatase (thickness: 20 nm) by ALD (*see* experimental section for details). Raman spectra were acquired on both individual spheres and planar (without spheres) regions. An example of sampling is displayed. Red arrows indicate two spheres used as μ-lenses. Blue arrows indicate reference planar regions. Scale bar: 5 μm

SI 2. ERI factor of anatase layer and Si substrate as a function of N.A.

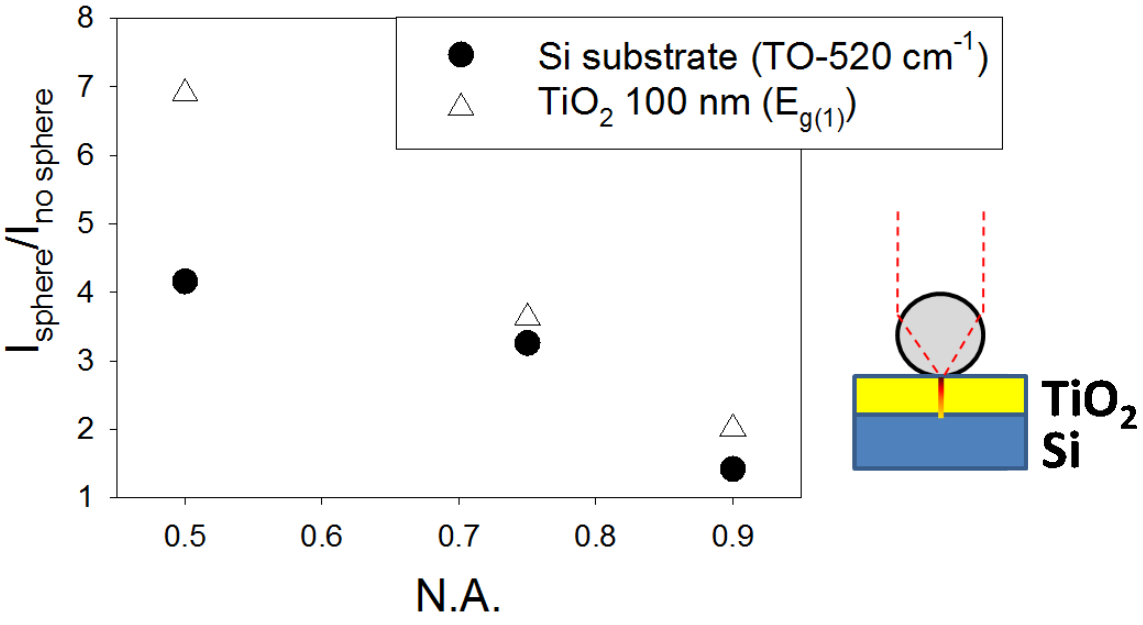

Figure S2. ERI factor (intensity ratio of a Raman mode between SiO_2-coated and uncoated samples) for either anatase or Si main Raman modes as a function of N.A of the microscope objective. The error bar is included in the experimental points. See the main text for details.

SI 3. Optical microscope images of SiO_2 spheres on Si substrates soaked by methylene blue (MB) solutions: example of sampling procedure.

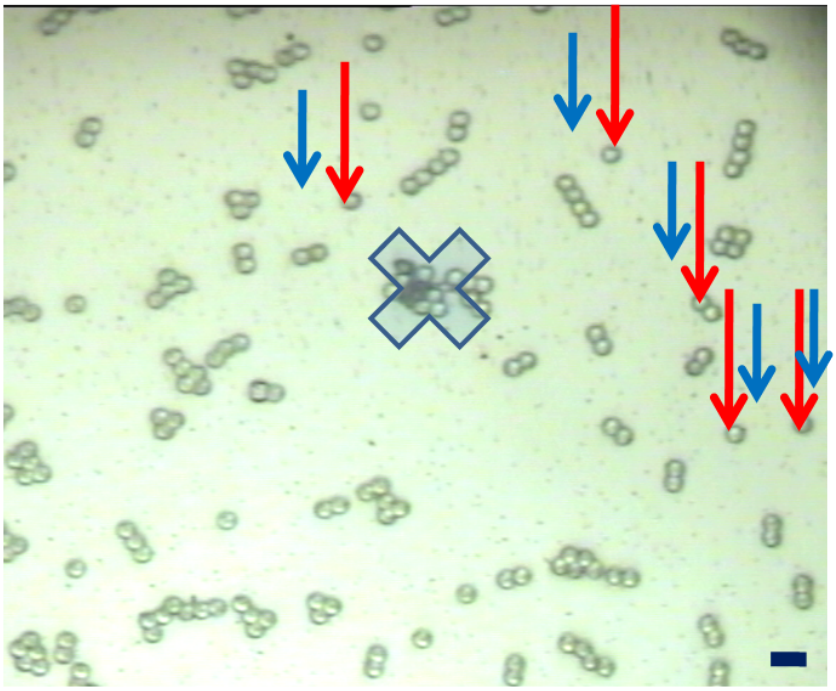

Figure S3. Example of SiO_2 microspheres drop-casted onto a single-crystal Si substrate which have been previously soaked in a 10^{-4} M MB solution (*see* experimental section for details). Raman spectra were acquired on both individual spheres and planar (without spheres) regions. An example of sampling is displayed. Red arrows indicate some spheres used as μ-lenses. Blue arrows indicate the corresponding reference planar regions. The light-blue cross indicates a region where MB is accumulated on the spheres. This type of region was not considered in acquisition of Raman spectra. Scale bar: 5 μm

SI 4. Au nanoislands: SEM and optical characterization of the Raman active substrate

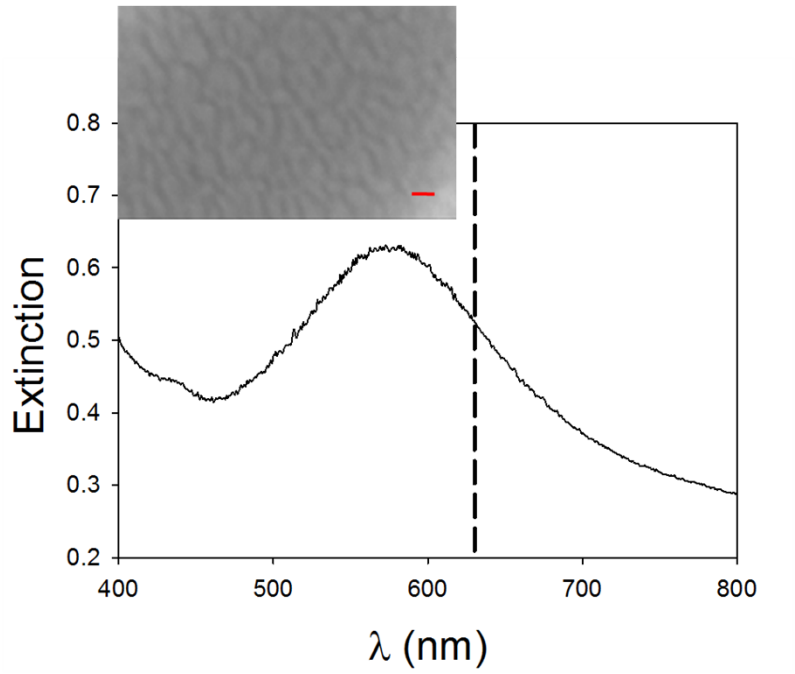

Figure S4. Inset: SEM image showing the morphology of a gold-coated sample. Scale bar: 20 nm. Main Figure: optical extinction showing the broad surface plasmon resonance band due to gold nanoislands. Reference: uncoated Si substrate. Dashed line indicates the position of the He-NE laser used for Raman experiments.

SI 5. Micromanipulation of colloidal μ-lenses

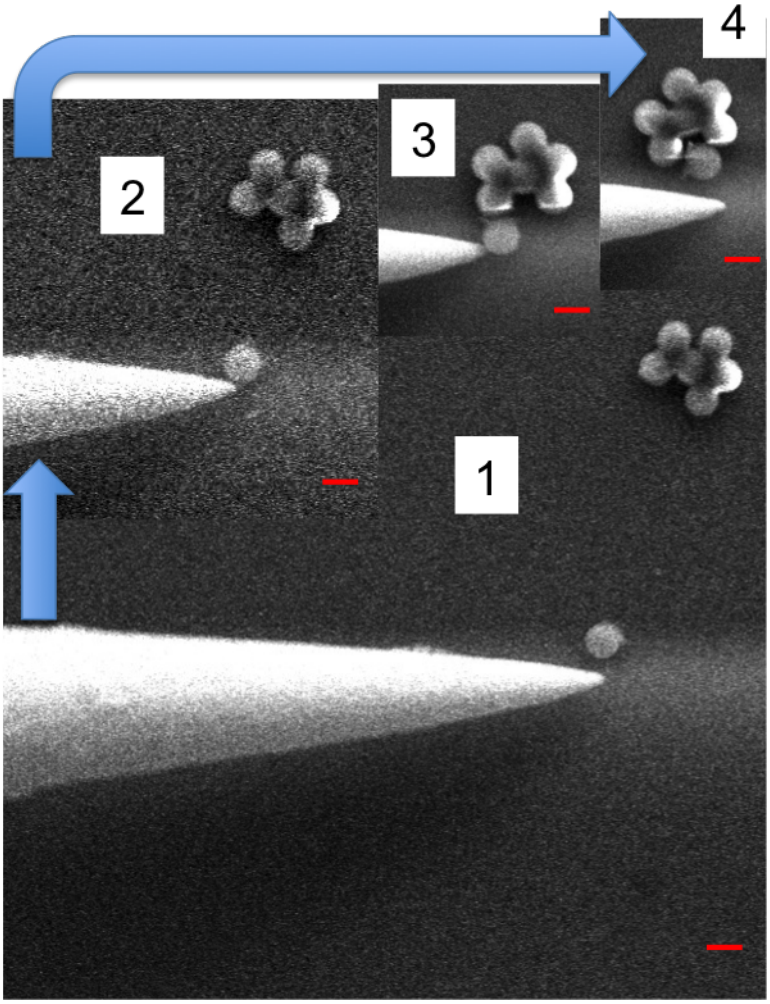

Figure S5. SEM images showing an example of controlled positioning of SiO_2 microspheres by means of a piezo-actuated micromanipulator. Scale bars: 2 μm.