

Article

Real-Time Monitoring of the In Situ Microfluidic Synthesis of Ag Nanoparticles on Solid Substrate for Reliable SERS Detection

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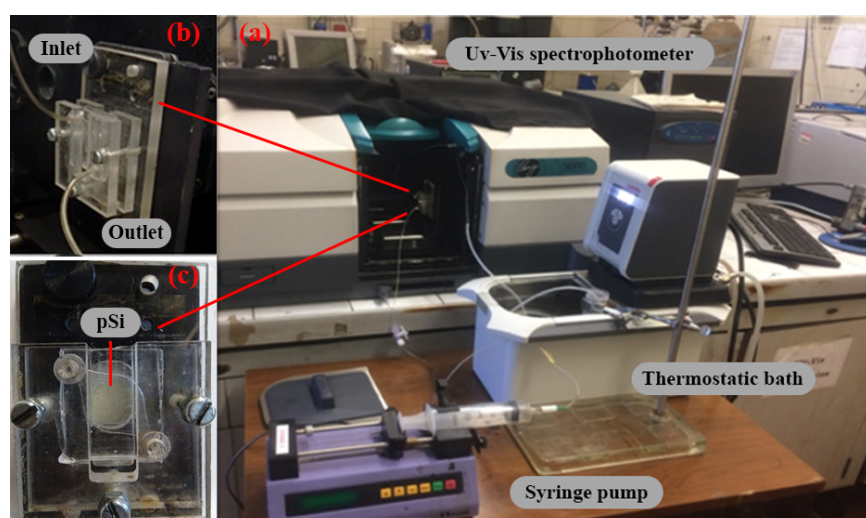


Figure S1. a) Overview of the complete experimental setup for the dynamic synthesis; b) and c) microfluidic chamber hosting the ultrathin pSi layer. A syringe pump drives the injection of the silver precursor solution into the microfluidic chamber located inside the UV-Vis spectrophotometer. The temperature of the precursor solution is controlled by means of a thermostatic bath.

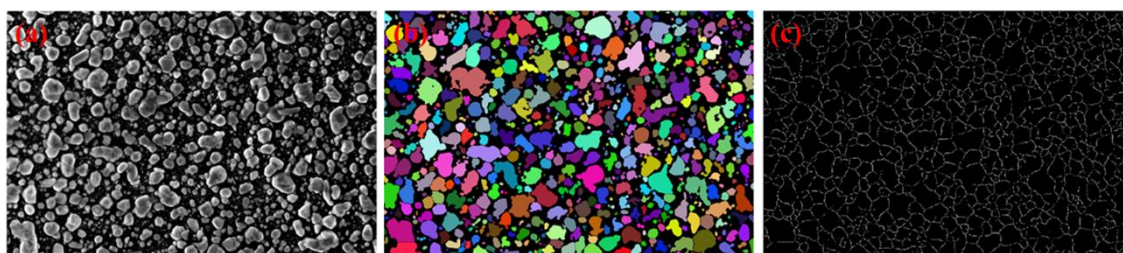


Figure S2. An example of image analysis – a) FESEM micrographs of a selected sample; b) identification of each nanoparticle; c) traces corresponding to the semi-distances between nanoparticles.

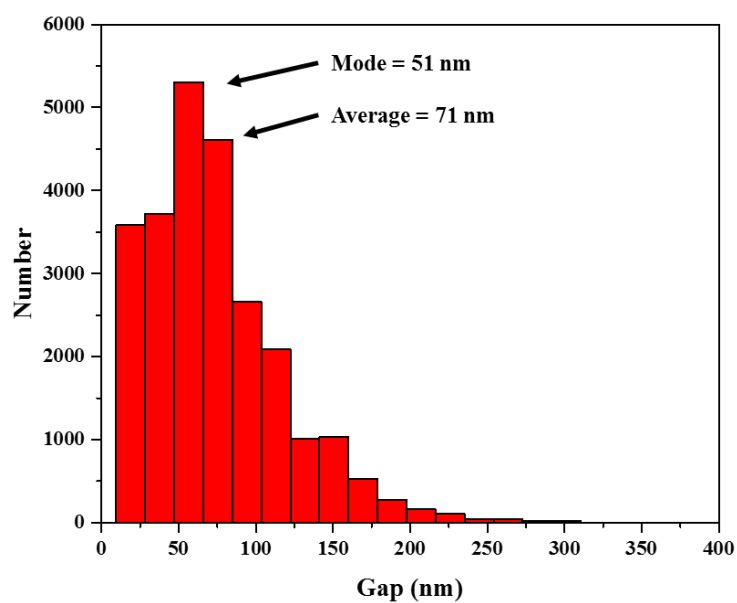


Figure S3. Size distribution of the inter-particle gaps.

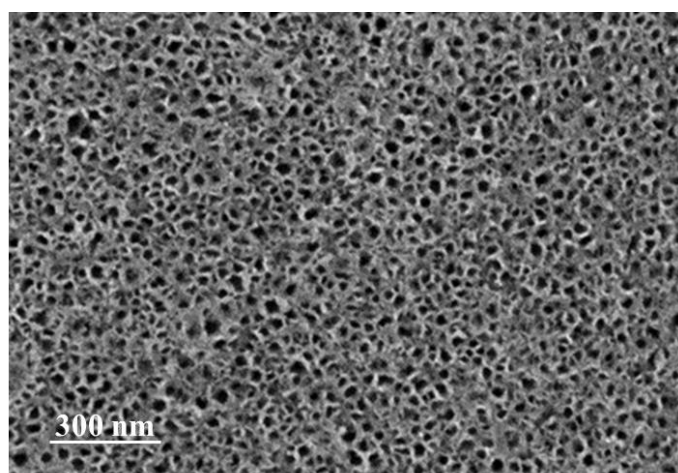


Figure S4. Top-view FESEM micrograph of the porous silicon membrane after the detachment from the original silicon substrate.

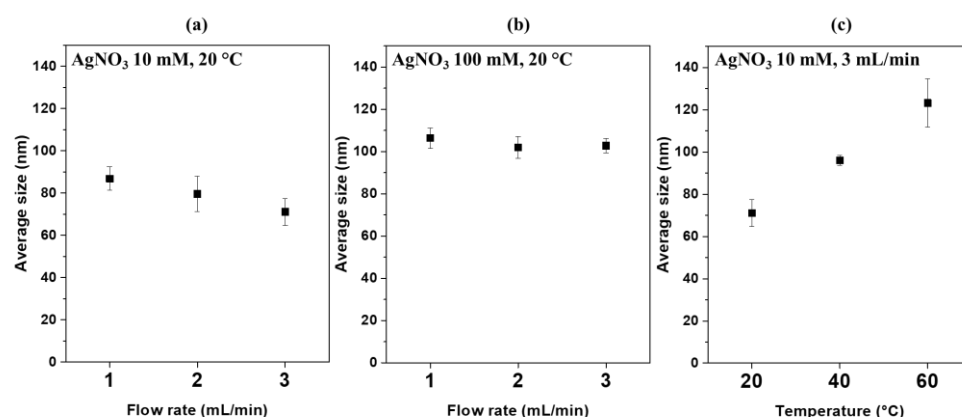


Figure S5. Effect on the average AgNP size of a) the flow rate at 10 mM AgNO_3 concentration and 20 °C b) the flow rate at 100 mM AgNO_3 concentration and 20 °C c) the temperature at 10 mM AgNO_3 concentration and 3 mL/min flow rate. The error bars represent the standard deviation obtained considering three replicas for each synthesis condition.

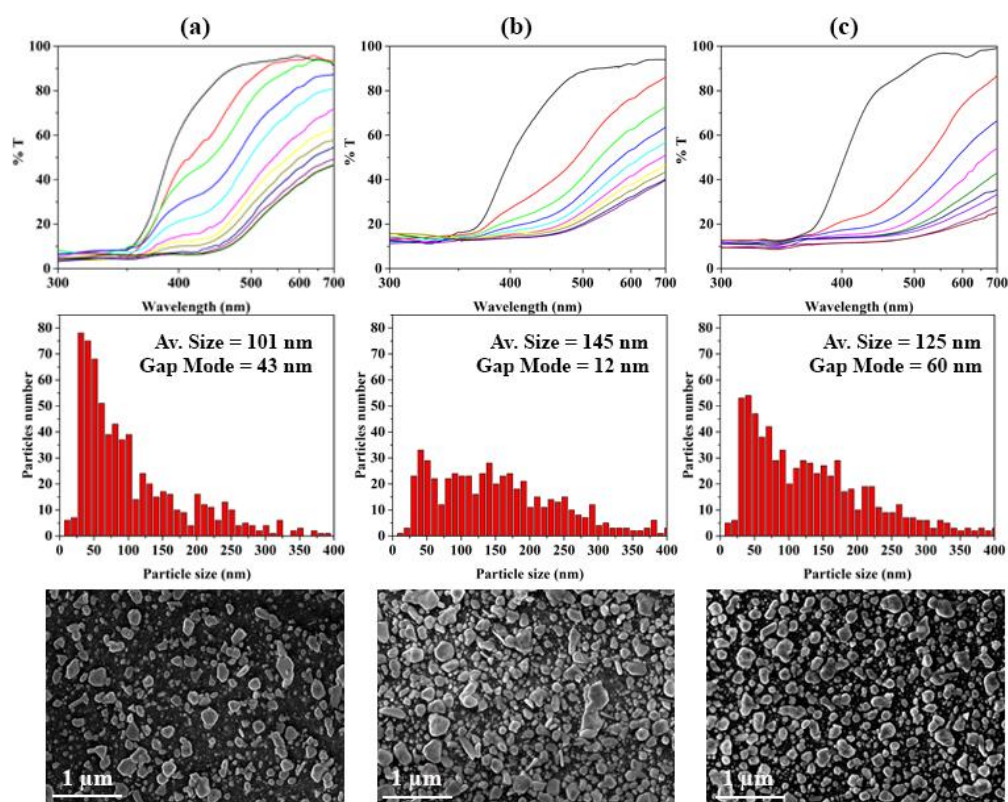


Figure S6. – UV-Vis transmittance spectra, particle size distribution, and FESEM micrographs of the samples synthesized in dynamic conditions using a 10 mM AgNO_3 at 60 °C employing a flow rate of a) 1 mL/min b) 2 mL/min c) 3 mL/min.

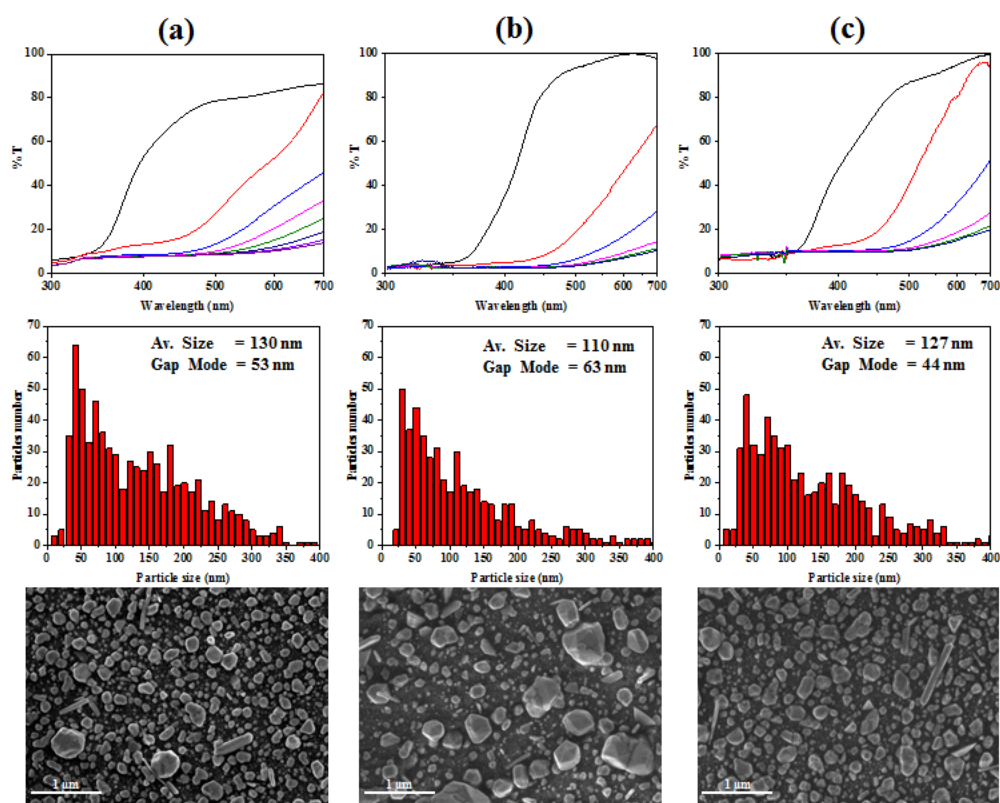


Figure S7. - UV-Vis transmittance spectra, particle size distribution, and FESEM micrographs of the samples synthesized in dynamic conditions using a 100 mM AgNO_3 at 60 °C employing a flow rate of a) 1 mL/min b) 2 mL/min c) 3 mL/min.