

March 26-28, 2018
Vienna, AustriaAkil Suzanna, Polym Sci, Volume 4
DOI: 10.4172/2471-9935-C1-008

POLYMER NANO-STRUCTURING INDUCED ONE-SHOT FABRICATION OF MONODISPERSE GOLD NANOPARTICLES RELEVANT FOR SERS

Akil Suzanna

Université de Lorraine, France

Polymer self-assembly has received special attention in the development of nanotechnologies especially for metallic nanoparticles synthesis. In this context, tailoring both nanoparticle shape and size has been intensified recently. Here, we use the vapor-induced phase separation (VIPS) method, which is homopolymer self-assembly to elaborate monodisperse metallic nanomaterials particularly relevant in sensing. To make it possible, a simple deposition of PMMA dispersion, doped with gold precursor onto silicon substrate allows a spontaneous formation of gold nanocubes (GNCs) loaded polymer holes (see Figure 1). To be able to control the structural and optical properties of these nanoparticles, crucial for SERS application, a physico-chemical study of the VIPS process was made. In particular, we investigated the influence of the precursor concentration to obtain monodisperse and uniform nanocubes.

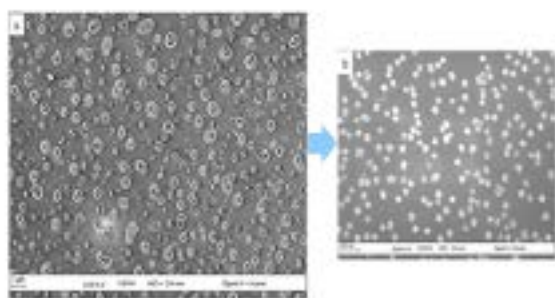


Figure 1: (a) SEM image of gold nanoparticles localized in PMMA nanoholes.

References

1. Omar, R., Naciri, A. E., Jradi, S., Battie, Y., Toufaily, J., Mortada, H., & Akil, S. (2017). One-step synthesis of a monolayer of monodisperse gold nanocubes for SERS substrates. *Journal of Materials Chemistry C*, 5(41), 10813-10821.
2. Khanafer, M., Issa, A., Akil, S., Hamieh, T., Adam, P. M., & Jradi, S. (2016). *RSC Advances*, 6(105), 102843-102852.
3. Khanafer, M., Izquierdo Lorenzo, I., Akil, S., Louarn, G., Toufaily, J., Hamieh, T., & Jradi, S. (2016). *ChemistrySelect*, 1(6), 1201-1206.
4. Moughames, J., Jradi, S., Chan, T. M., Akil, S., Battie, Y., Naciri, A. E., & Cousin, J. (2016). *Scientific reports*, 6.
5. Battie, Y., Izquierdo-Lorenzo, I., Resano-Garcia, A., Naciri, A. E., Akil, S., Adam, P. M., & Jradi, S. (2016). *Journal of Nanoparticle Research*, 18(8), 217.

Biography

Akil Suzanna is an Assistant Professor in the LCP-A2MC, Institut Jean Barriol, Université de Lorraine, Metz, France. Her primary research area is Nanotechnology. She currently develops new methods of fabrication of metallic and semiconductor nanoparticles for the detection of few molecules. She's mainly interested by the elaboration of SERS sensors based on simple and cheap synthesis ways. Her other research interests include nanofabrication, plasmonics, SERS, sensing and semi-conductors.

suzanna.akil@uiv-lorraine.fr