

Nanoplasmonics and Surface Enhanced Spectroscopy

Towards the plasmonic optical biosensor for single molecule translocation and analysis

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We report fabrication of Au nanopore formation on pyramid by using focused ion beam technique and electron beam irradiation techniques. Under electron beam irradiations on the specimen, carbon incorporation with electron beam is reported [1, 2]. We initially observed the no Au nanoparticles on the diffused membrane by using transmission electron microscopy (TEM). After the samples were kept under the room environments for several months, Au particles were formed on the diffused membrane via Ostwald ripening as below. We also observed the bi-stable phase of Au crystalline structure on the diffused membrane during TEM imaging process via Spinodal decomposition. Fabricated nanopore integrated with Au particles can be utilized as optical nanopore for single molecule analysis.

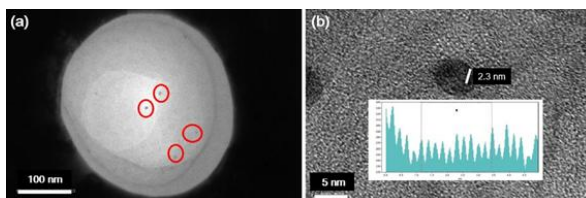


Fig.1. TEM images of electron beam induced membrane and Au particles

1. Choi, S.S., Park, M.J., and et al., S. J. Protein Fabrication of Nanopore on Pyramid// *Appl Surf. Sci.*, 2014, **310**.-P. 196-203.
2. Choi, S.S., Park, M.J., Nanopore formation on Au coated pyramid under electron beam irradiations// *Sens. Bio-Sens. Res.* 2016, **7** P. 153-161.