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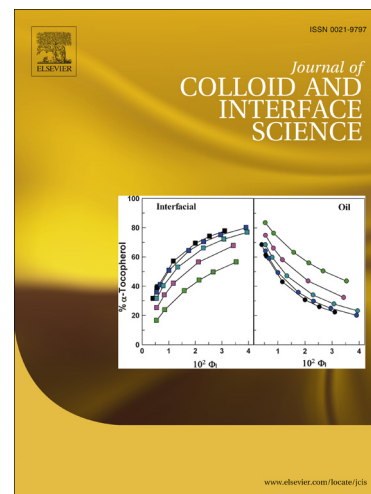
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# A New Plasmonic Device Made of Gold Nanoparticles and Temperature Responsive Polymer Brush on a Silicon Substrate

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**ABSTRACT** This paper reports a general stepwise route assembling interface-mediated RAFT polymerization of 2-methoxyethoxy ethyl methacrylate and conversion of dodecyl trithiocarbonate end groups to thiol groups for gold nanoparticle assemblies. We intended by this way a new plasmonic device made of gold nanoparticles (Au NPs) and temperature responsive poly[(2-methoxyethoxy)ethyl methacrylate] [poly(MEO<sub>2</sub>-MA)] brush on a silicon substrate. This polymeric layer replies to temperature changing by conformational variation and is therefore able to change the distance between the Au NPs on the brush layer with 5,5-dithiobis(2-dinitrobenzoic acid) (DTNB). We show that an increment of the external temperature reversibly stimulates a significant increase of the DTNB SERS signal.

**Keywords:** *temperature-responsive polymer brushes, phase transition temperature, gold nanoparticle, plasmonic device, Surface-enhanced Raman spectroscopy.*

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