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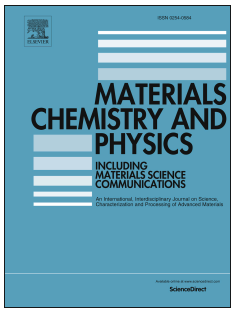

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Room Temperature Synthesis of Porous Gold Nanostructures by Controlled Transmetallation Reaction *via* Chicken Egg Shell Membrane

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ABSTRACT. The formation of porous gold **nanostructures** in aqueous medium at room temperature using transmetallation reaction (TM reaction) that involves sacrificial silver nanoparticles and Au^{3+} ions ($HAuCl_4$) controlled using a naturally available chicken egg shell membrane is reported in this article. The formation of porous gold **nanostructures** via TM reaction is inferred from UV-Vis absorption spectra. Crystallinity is confirmed by X-ray diffraction (XRD) and selected area electron diffraction (SAED) patterns. Porous gold tube like structures seen in the Field Emission Scanning Electron Microscopic (FESEM) images was confirmed by the Transmission Electron Microscopic (TEM) images. Energy dispersive spectroscopy (EDS) confirmed the presence of only gold in the final product. The porous gold **nanostructures** could show fluorescence in Yeast cells, but the cell intake was limited. Glucose functionalized porous **gold nanostructures** could enter Yeast cells showing fluorescence, but the cells got killed. The synthesized porous **nanostructures** tagged with the cell permeant dye acridine orange (AO) was found to increase the fluorescence substantially in cell staining, compared to bare AO and