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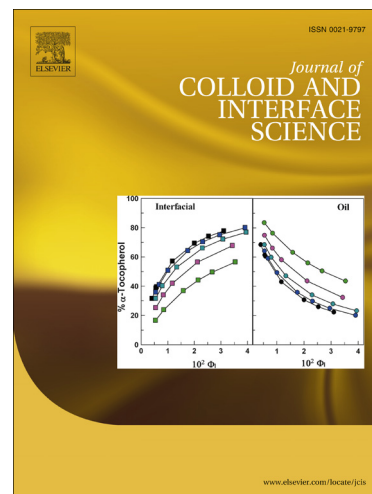
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Two-dimensional colloidal crystal assisted formation of conductive porous Au films with flexible structural controllability

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ABSTRACT

Two-dimensional (2D) colloidal crystals of polystyrene (PS) particles were used as a structure-controlling template to fabricate conductive Au films with an ordered array of nanoholes. The fabrication mainly involved the functionalization of the supporting substrate with polyelectrolyte (PE) functional layers, self-assembly of Au nanoparticles, and electroless deposition of gold. The self-assembly of Au nanoparticles and electroless deposition of gold were macroscopically monitored using ultraviolet-visible (UV-vis) spectroscopy based on the changes in both the extinction spectra of Au nanoparticles and the optical responses of ordered arrays of PS particles. By scanning electron microscopy (SEM) characterization, it was found that Au nanoparticles were assembled into a film structure with orderly dispersed

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