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Directing Close-packing of Au Nanoparticles at a Water/Hexane Interface

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This paper reports a method for assembling Au nanoparticles into close-packed 2D arrays at a hexane-water interface with alkanethiol in the hexane layer. The destabilization of Au nanoparticles by the addition of alcohol caused the Au nanoparticles to adsorb to an interface where the surface of entrapped Au nanoparticle was in-situ coated with the long-chain alkanethiols present in a hexane layer. The adsorption of alkanethiol to the Au nanoparticle surface is a key feature in forming close-packed Au nanoparticle arrays. The film morphology was determined to be either monoparticulate or multi-particulate depending on the 1-dodecanethiol concentration.