

Freestanding Ultrathin Electrochemically Grown  
Polyaniline/Gold Nanocomposite Membranes:  
Characteristics & Applications

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Nanostructured composite materials of Polyaniline/Gold have been produced using a novel electrochemical process. Freestanding ultra-thin (~200 nm) PANI films have been grown on Platinum electrodes coated with a sacrificial Gold layer. This sacrificial layer can be dissolved in Chloride solution and the resultant tetrachloroaurate ions may be selectively and quantitatively reduced into the Polyaniline at the imine moiety to produce membranes with different gold sizes in the 10s of nm range with the potential to go much smaller. Preliminary experiments with these films have shown these materials to have promise as sensing materials in Kelvin Probes and chemically sensitive field effect transistors. These films maintain cohesion due to the properties of the dense PANI layer that grows directly on the electrode prior to the onset of dendritic PANI cluster growth and are thus suitable for TEM studies or optical studies.