

# Polymer-based nanocomposites: In situ generation and immobilization of gold nanoparticles on poly(n-vinyl-2-pyrrolidone) and poly( $\epsilon$ -caprolactone) thin films

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Copyright © 2017 American Scientific Publishers All rights reserved. In this work, we report an interesting method for simultaneous obtaining and immobilization of gold nanoparticles onto polymer thin films. Polymer-based nanocomposites were generated by spontaneous adsorption and reduction of Au III ions onto polymeric films surfaces. Poly(N-vinyl-2-pyrrolidone) and poly( $\epsilon$ -caprolactone), polymers that have shown their capability to reduce Au III and stabilize the generated gold nanoparticles, were used. The polymer film thickness and hydrophilic or hydrophobic nature of the solid substrate on which the polymers are deposited, directly affect the quantity and characteristics of the gold nanoparticles incorporated in films. Therefore, these parameters can be used to obtain nanocomposites with modulated features. The method presented is a simple route to produce nanocomposites with a high potential for use in diverse technological applications.