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Plasmon resonance effect caused by gold nanoparticles formed on titanium oxide films

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Abstract

Gold nanoparticles were distributed by spray pyrolysis technique on bare glass substrates and on glass covered by titanium dioxide thin films grown by atomic layer deposition, and were embedded in titanium dioxide layers. Plasmonic absorption was detected in the visible spectral range. The particles deposited on glass and on 80 nm thick titanium dioxide film resulted in appearance of an absorption band peaking at 550 nm. The plasmonic absorption maxima shifted towards longer wavelengths after embedding the particles into a top TiO₂ layer. Atomic layer deposition of TiO₂ films assisted in fixing and separating the metal particles on the surface, without destructive influence on the plasmonic behaviour.

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