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Optical response of ultra-thin titanium nitride films on brass and gold plated brass surfaces.

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Highlights

- Optical response of Ultra-thin TiN thin films on brass and gold coated brass substrates is studied.
- Specular reflectance of the films showed minima in the region between 1.7 and 2.5 eV.
- The minima are attributed to surface plasmon resonances.
- Ageing of films in air does not show significant changes in optical response

Abstract

Nanocrystalline TiN thin films have been deposited by DC reactive magnetron sputtering on brass and gold coated brass substrates. Atomic force microscope images of the 20 nm thickness films indicate that grain sizes are in the range of 30-70 nm. Specular reflectance in the visible and near infrared region is between 5-30%. Reflectance minima, attributed to surface plasmon resonances, are observed in the region between 1.7 and 2.5 eV depending on percentage of nitrogen in the sputtering gas mixture. The plasmon resonances can be tuned by varying the N_2 percentage in the sputtering atmosphere. Specular reflectance and dielectric functions of films aged in air for one year show that the changes in values are very negligible. The ultra-thin TiN