Flexible Soft-Printed Synthetic and Bio-Polymer Films with Gold Nanoparticles

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Overview

A novel soft-printing method enables the precise deposition of gold nano-islands (AuNIs) onto flexible synthetic and bio-polymer films. This patented structure delivers tunable optical effects across UV-NIR, enabling gentle focused photothermal warming and light-scattering/brightening to visibly smooth skin appearance, along with optional antimicrobial surface benefits. The patch conforms like an adhesive strip, remains breathable, and can be engineered for clear or tinted finishes.
Scalable soft-printing makes it compatible with common cosmetic substrates, bringing salon-grade, light-active performance to everyday beauty care.

Applications

Cosmetic applications - illuminating masks, under-eye brighteners, blemish covers, and smart patches that visually signal treatment time or exposure.

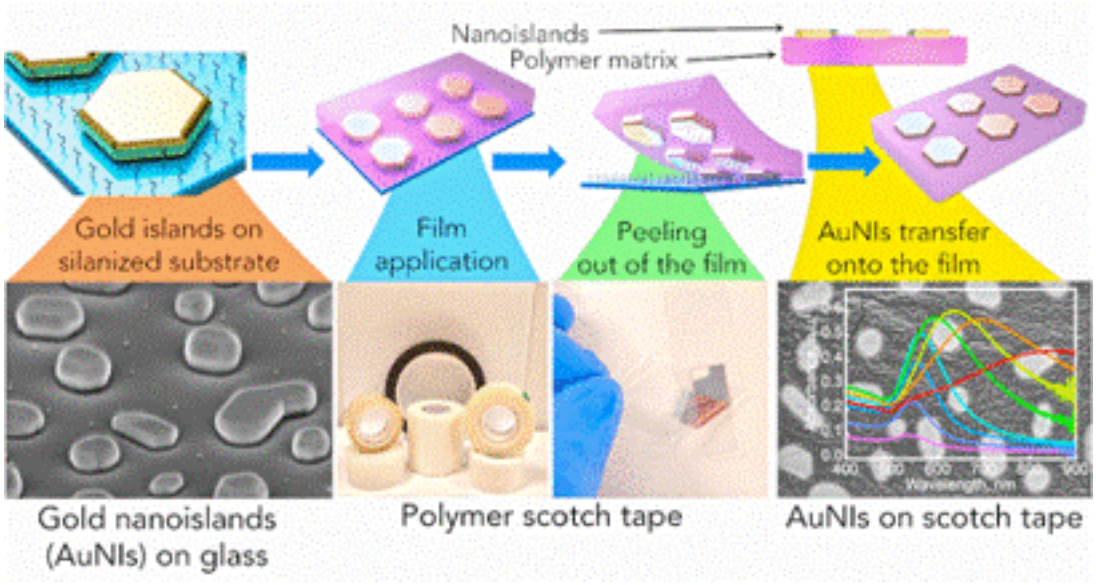
Medical applications - Antimicrobial surfaces and targeted thermal treatment.

Differentiation

- Customizable plasmonic properties while maintaining high transparency
- Cost-effective fabrication
- Biocompatible
- Compatible with a variety of substrates, including silk protein-based films

Development Stage

Soft-printing tape lithography has been successfully used to deposit plasmonic nanostructures on flexible polymer films, demonstrating tunable plasmonic properties with proof-of-concept results in silk protein-based films.


Nanoislands
Polymer matrix
Gold islands on silanized substrate
Film application
Peeling out of the film
AuNIs transfer onto the film
Gold nanoislands (AuNIs) on glass
Polymer scotch tape
AuNIs on scotch tape