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Gold nanoparticle-embedded DNA thin films for ultraviolet photodetectors

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Highlights

- DNA thin films incorporated with Au NPs are fabricated to demonstrate efficient and high-performance UV photodetectors.
- The Au NP-embedded SDNA thin films are characterized in order to understand their physical and chemical properties.
- The FTIR and XPS elucidate how Au NPs become embedded in SDNA, through analysis of chemical binding and chemical composition.
- Photovoltage measurements are conducted to investigate the significance of photoresponse and retention characteristics.
- Photovoltage response indicates the stability, durability, and high Au NP retention.

ABSTRACT

Although DNA (low-cost, highly transparent, low optical loss, biodegradable, non-toxic, and highly flexible) and gold nanoparticles (Au NPs, exhibiting interband transition and localized surface plasmon resonance) have been intensively studied, DNA with Au NPs in photodetectors is rarely discussed. Here, we constructed salmon DNA (SDNA) thin films and

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