I3S 2021 — 8th International Symposium on Sensor Science
17–28 May 2021, ONLINE

Flexible SERS Sensors based on Carbon Nanomaterials-Supported Au Nanostructures

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Outline

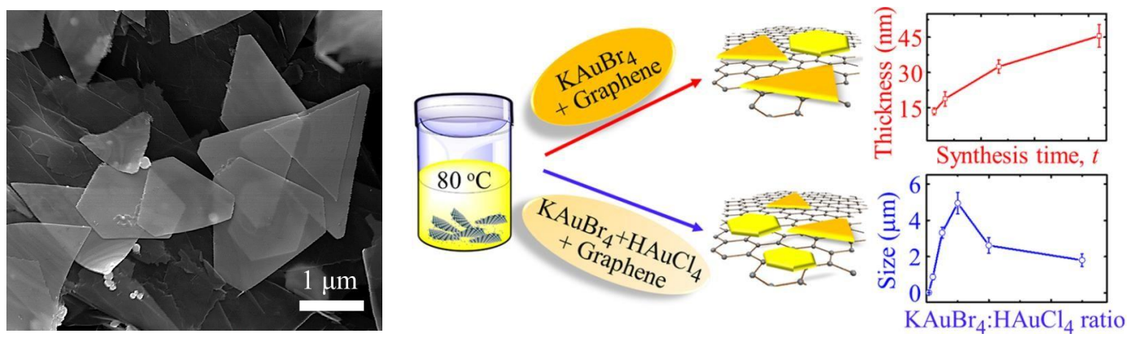
Employing novel strategies of one-pot synthesis to grow anisotropic gold nanocrystals on carbon nanomaterials substrates (graphene and CNT), achieving sensitive SERS sensing.

This poster includes the following sections:

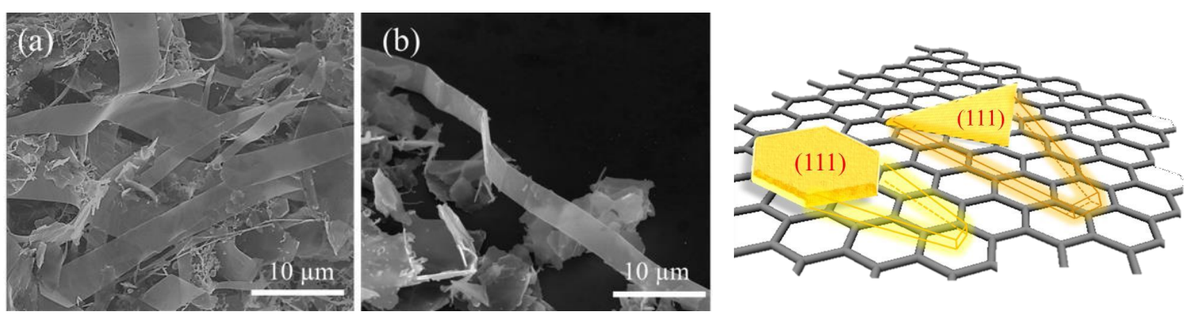
1.Structures of graphene supported Au nanocrystals
2.Structures of CNT supported Au nanocrystals
3.Application-flexible SERS sensors
4.Outlook of extended flexible and wearable sensors

1. Structures of Graphene Supported Au Nanocrystals

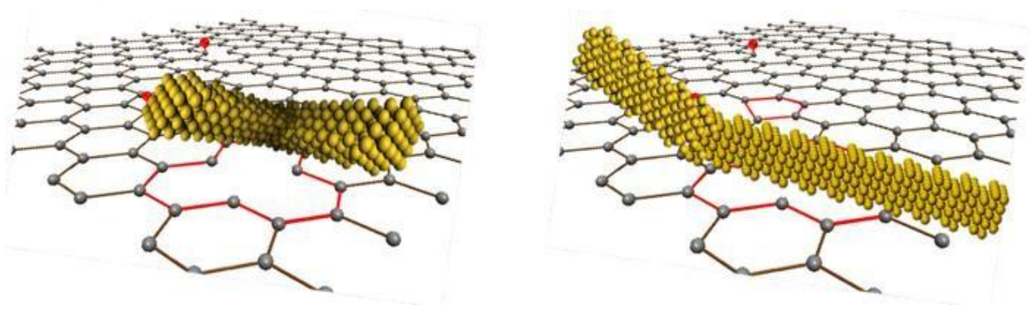
➢ Graphene/Au Nanoplates



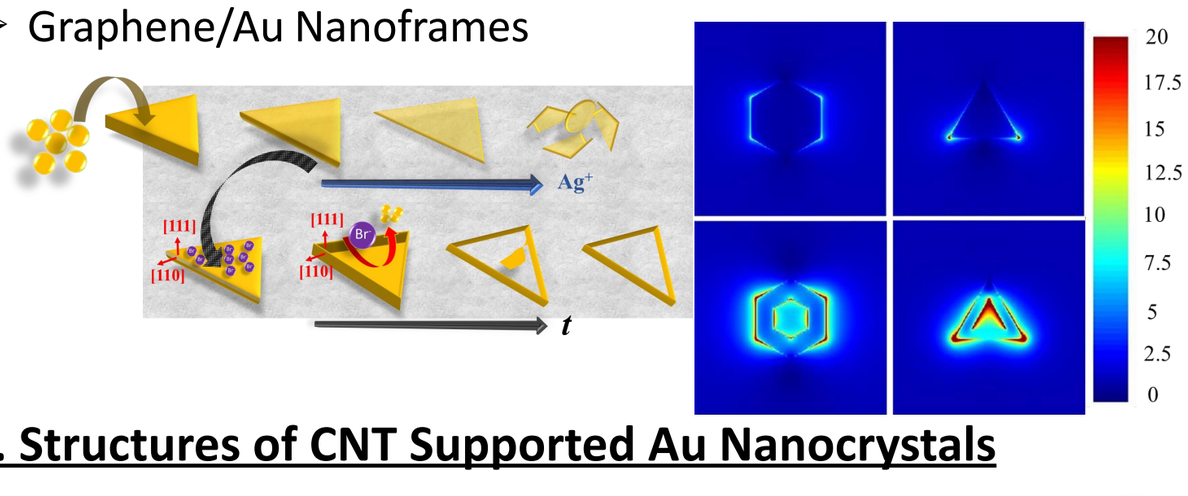
➢ Graphene/Au Nanobelts



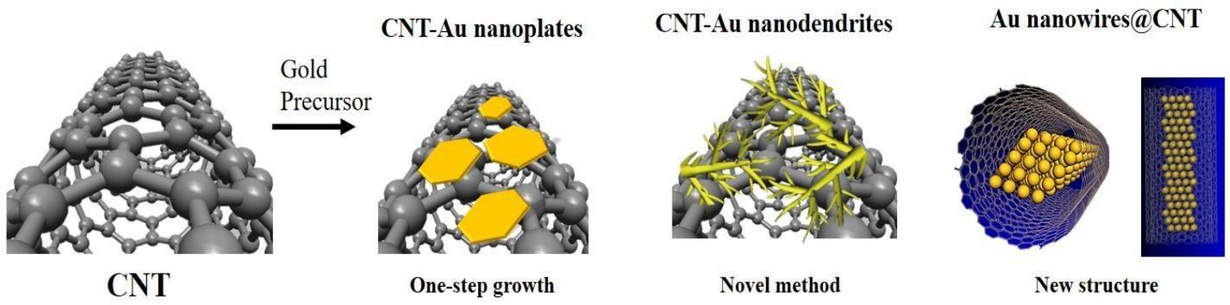
➢ Graphene/Au Nanowires



➢ Graphene/Au Nanoframes



2. Structures of CNT Supported Au Nanocrystals

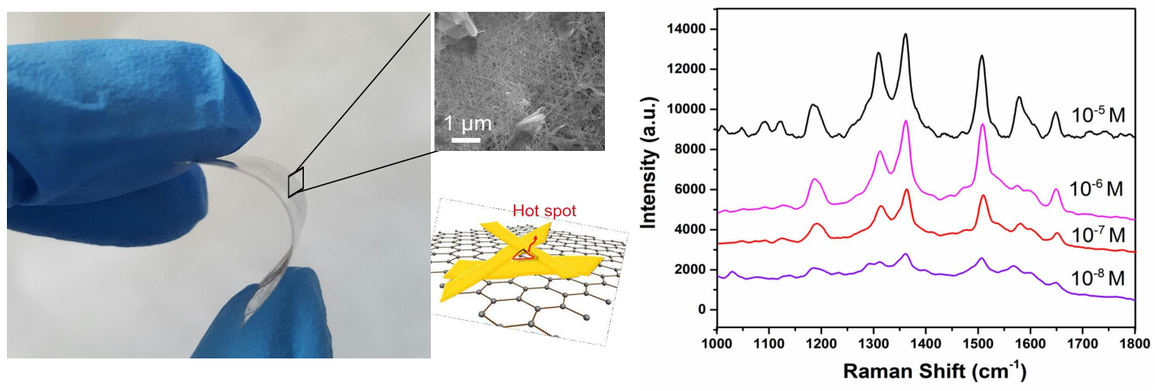


3. Application-Flexible SERS Sensors

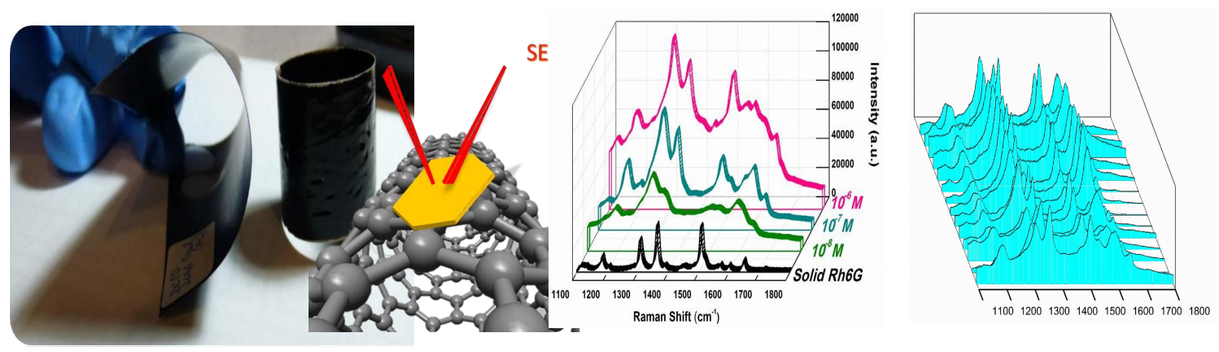
Strategies:

- Improve the coverage density of Au nanocrystals
- Enhance the distribution uniformity of Au nanocrystals

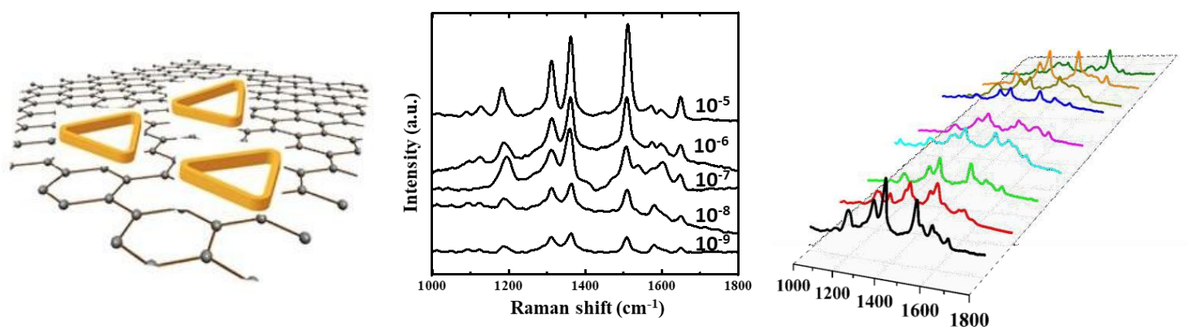
➢ Graphene/Au Nanobelts



➢ CNT sheet/Au Nanoplates



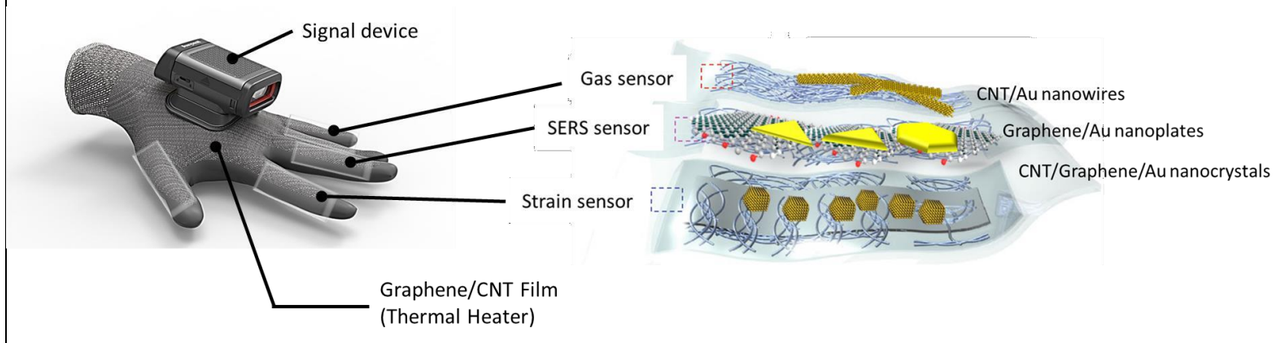
➢ Graphene/Au Nanoframes



Status:

- Detected analytes at concentration levels down to 10^{-9} M
- The value of RSD is 13.2% showing an excellent reproducibility
- Stable in harsh environment

4. Outlook



Based on the flexible substrates of graphene and carbon nanotubes and different structures of gold nanocrystals, it's expected to be applied to different types of wearable flexible sensors, such as gas sensors, strain sensors and SERS sensors, etc.