

# Fully Alloyed Silver and Gold Nanostructures

Tech ID: 24261 / UC Case 2014-618-0

## PATENT STATUS

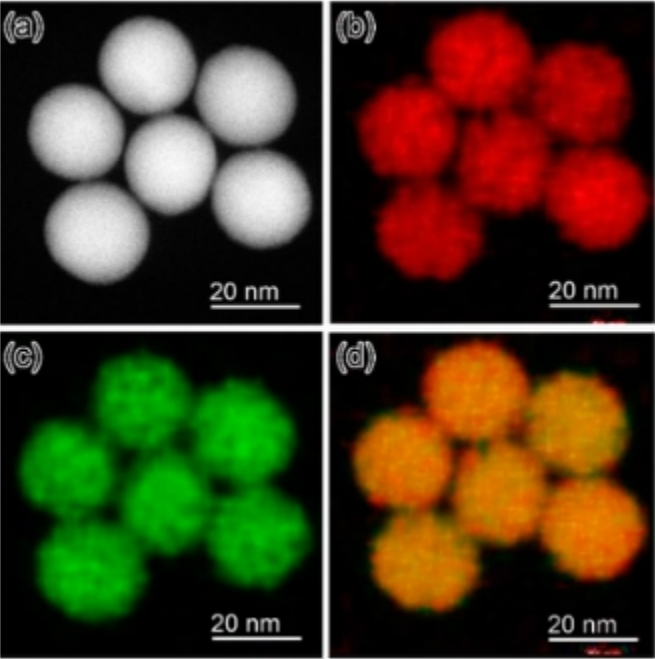
Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,577,678	03/03/2020	2014-618

## BRIEF DESCRIPTION

**Background:** Biomolecular imaging is important in understanding characteristics of molecules and analyzing quantitative data for research. Gold has been used for Surface Plasmon Resonance (SPR) which is utilized for biomolecular imaging. Because of Gold’s high stability structurally and chemically, it is resourceful in this sort of technology. Compared to Gold, Silver does not have as strong of a stability in non ideal chemical environments, but has high reactivity, supports strong surface plasmon polarization modes, and has higher storage of electrical energy than Gold.

**Description:** UCR researchers have created Silver-Gold alloy nanospheres through annealing techniques which may be used in SPR that creates optimal and effective results. By annealing the Silver and Gold metal alloy, it has shown remarkable stability in harsh chemical environments, extremely narrow bandwidths, and shows large extinction pathways. These specific characteristics enable many plasmonic applications with high performance and long lifetime, especially any involving corrosive species making the Silver-Gold alloy the most favorable choice for SPR.

## IMAGES



Elemental Analysis of Silver-Gold alloy nanospheres. a)Elemental Composition of alloy (b,c) Chemical Characterization map of Silver and Gold respectively; (d) merged image of (b) and ( c) which shows how high temperature annealing enables the mixing at atomic scale.

## PUBLICATIONS

<http://pubs.acs.org/doi/abs/10.1021/ja502890c>

## SUGGESTED USES

- Chemical or Biomolecular Sensing

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## OTHER INFORMATION

### KEYWORDS

Surface Plasmon Resonance,  
  
Imaging, Nanoparticles, optics

### CATEGORIZED AS

- ▶ **Optics and Photonics**
  - ▶ All Optics and Photonics
- ▶ **Biotechnology**
  - ▶ Industrial/ Energy
- ▶ **Imaging**
  - ▶ Medical
  - ▶ Molecular
- ▶ **Materials & Chemicals**
  - ▶ Nanomaterials
- ▶ **Medical**
  - ▶ Devices
- ▶ **Nanotechnology**
  - ▶ Materials
  - ▶ NanoBio
  - ▶ Tools and Devices
- ▶ **Sensors & Instrumentation**
  - ▶ Analytical
  - ▶ Biosensors
  - ▶ Environmental Sensors
  - ▶ Medical

### RELATED CASES

2014-618-0



Imaging



Photothermal Therapy of Tumors

▶ Sensitization in Solar Energy Harvesting

ADVANTAGES



The Silver-Gold metal alloy’s chemical characteristics best perform SPR by silver being highly reactive



High performance and high lifetime of metal alloy



Annealing Technique can be used for various other metals such as Platinum, Palladium, and Nickel to create high energy catalysts .

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