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# Formation of Polymers on Nanostructures Under X-ray Irradiation

Tech ID: 22908 / UC Case 2013-325-0

## ABSTRACT

First time demonstration of enhanced formation of polymers on nanostructures under X-ray irradiation.

## FULL DESCRIPTION

Researchers at UC Davis have developed methods of formation of a polymer from a monomer on a metal-based nanoparticle under X-ray irradiation or the dissolution of metal ions from this nanoparticle under X-ray irradiation, and more specifically methods of enhancing formation of a polyaniline polymer from an aniline monomer on a silver core - gold shell nanoparticle under X-ray irradiation and release of Ag ions from this core-shell nanoparticle. X-rays are highly penetrating, and nanomaterials can pinpoint the growth of polymers down to nanometer scale. Therefore it is possible to use short wavelength X-rays and nanomaterials to create high precision polymer structures of nanometer resolution.

## APPLICATIONS

- Use of short wavelength X-rays and nanomaterials to create high precision polymer structures of nanometer resolution can potentially be used by drug, semiconductor and sensor industry
- X-ray triggered release of Ag ions can function as targeted antimicrobial release

## FEATURES/BENEFITS

- Uses nanostructures and wide beam X-rays to make nanostructures of polymers
- Alternative method of making photomasks

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	<a href="#">9,718,922</a>	08/01/2017	2013-325

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## INVENTORS

- Guo, Ting

## OTHER INFORMATION

### KEYWORDS

X-ray nanochemistry,  
  
chemical enhancement,  
  
physical enhancement,  
  
polymerization,  
  
nanomaterials, X-rays,  
  
lithography,  
  
semiconductors, sensors,  
  
antimicrobial, triggered  
  
release, polyaniline

## CATEGORIZED AS

- **Biotechnology**
  - Industrial/ Energy
- **Engineering**
  - Engineering
- **Materials & Chemicals**
  - Nanomaterials
  - Polymers
  - Superconductors
- **Nanotechnology**
  - Materials
  - NanoBio
- **Semiconductors**
  - Design and Fabrication
  - Materials

- **Sensors & Instrumentation**
  - Analytical
  - Scientific/Research

**RELATED CASES**

2013-325-0

**ADDITIONAL TECHNOLOGIES BY THESE INVENTORS**

- Enhancement of X-Ray Radiation Using Nanomaterials
- X-Ray-Triggered Release of Drugs from Nanoscale Drug Carriers
- Measurement of Nanoscale Physical Enhancement by Materials under X-ray Irradiation
- Combined Individual Nanomaterial Enhancements for Total X-Ray Enhancement

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