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 polyanilne 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	9,718,922	08/01/2017	2013-325

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INVENTORS

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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

- Nanoparticle Capsules for Magnetically Controlled Color-Changing Materials
- 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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