

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	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

- ▶ 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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