Enhancement of X-Ray Radiation Using Nanomaterials

Tech ID: 22280 / UC Case 2012-303-0

ABSTRACT

New phenomenon of dynamic enhancement of chemical reactions by nanomaterials under hard x-ray radiation.

FULL DESCRIPTION

The use of inert nanomaterials such as gold nanoparticles to increase the absorption of x-ray began a few years ago however; because gold nanoparticles can be catalytically active under suitable conditions, it is likely that these nanomaterials may behave more than simply enhancing the absorption of x-rays in a highly reactive environment such as those created by x-ray radiation.

Researchers at the University of California, Davis campus have discovered that x-ray effects can be chemically enhanced with the use of certain nanomaterials under suitable conditions. This new concept of chemical enhancement is enabled by both the radiation generated ROS (reactive oxygen species) and the surface of nanomaterials. This novel chemical enhancement is believed to be ubiquitous and may significantly alter the outcome of chemical reactions under x-ray irradiation with the assistance of nanomaterials.

APPLICATIONS

- Energy production
- Nuclear waste processing
- Radiation chemistry
- Chemical synthesis
- Radiotherapy
- Catalysis
- Sensing
- Nanomaterial x-ray dosimeters
- Nanotoxicity
- Nanomedicine

FEATURES/BENEFITS

- Beneficial to use high rate of irradiation
- Enhancement relies on the surface of the nanomaterials

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,604,955	03/28/2017	2012-303

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Formation of Polymers on Nanostructures Under X-ray Irradiation
- 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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INVENTORS

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OTHER INFORMATION

KEYWORDS

Chemical enhancement, Nanomedicine, Nanoparticles, Radiosensitizers, Radiotherapy, X-ray enabled processes

CATEGORIZED AS

- **Imaging**
  - Medical
- **Materials & Chemicals**
  - Nanomaterials
- **Medical**
  - Imaging
- **Nanotechnology**
  - NanoBio

RELATED CASES

2012-303-0

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