Photoelectrochemical Etching Of P-Type Semiconductor Heterostructures
Tech ID: 23783 / UC Case 2008-533-0

BRIEF DESCRIPTION

A novel process to achieve PEC etching of p-type semiconductors simply and efficiently.

BACKGROUND

Photoelectrochemical (PEC) wet etching is applied to a variety of semiconductors including GaAs, InP, and GaN. PEC etching of GaN is of great interest due to the limited alternatives for room temperature, wet etching. This process consists of a light source and an electrochemical cell with the semiconductor being the anode and metal patterned directly onto it to act as the cathode.

Typically, this etching is confined to the surface of n-type materials while electrons are confined to the surface in p-type materials. The electrons at p-type surfaces constrain etching and make PEC etching of p-type semiconductors difficult.

DESCRIPTION

Researchers at the University of California, Santa Barbara have developed a novel process to achieve PEC etching of p-type semiconductors simply and efficiently. This method utilizes heterostructures to open up the possibility for a wide range of device fabrication processes requiring etching of p-type materials. The wet etch nature of the process provides the capability for rapid, low-damage etching compared to the traditional ion-assisted plasma etching techniques.

ADVANTAGES

- Ability to wet etch p-type materials
- Form deep, anisotropic trenches
- Bandgap selectivity
- Defect selectivity

APPLICATIONS

- Semiconductors

PATENT STATUS

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CONTACT

University of California, Santa Barbara Office of Technology & Industry Alliances
dobis@tia.ucsb.edu
tel: View Phone Number.

INVENTORS

- DenBaars, Steven P.
- Hu, Evelyn L.
- Nakamura, Shuji
- Schmidt, Mathew C.
- Tamboli, Adele C.

OTHER INFORMATION

KEYWORDS

PEC, cenIEE, indssl

CATEGORIZED AS

- Engineering
- Energy
- Lighting
- Other
- Semiconductors
- Design and Fabrication

RELATED CASES

2008-533-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Backside-Illuminated Photoelectrochemical (Bipec) Etching
- Reduced Dislocation Density of Non-Polar GaN Grown by Hydride Vapor Phase Epitaxy
- III-Nitride Tunnel Junction with Modified Interface
- Enhanced Light Extraction LED with a Tunnel Junction Contact Wafer Bonded to a Conductive Oxide
- Increased Light Extraction with Multistep Deposition of ZnO on GaN
- Hybrid Growth Method for Improved III-Nitride Tunnel Junction Devices
- Contact Architectures for Tunnel Junction Devices
- Internal Heating for Ammonothermal Growth of Group-III Nitride Crystals
- Methods for Fabricating III-Nitride Tunnel Junction Devices
- Multifaceted III-Nitride Surface-Emitting Laser
- Reduction in Leakage Current and Increase in Efficiency of III-Nitride MicroLEDs
- Vertical Cavity Surface-Emitting Lasers with Continuous Wave Operation
- Heterogeneously Integrated GaN on Si Photonic Integrated Circuits
- Distributed Feedback Laser with Transparent Conducting Oxide Grating
- Retaining Injection Efficiency and Optical Properties of Laser Diodes with Built-in Polarization Fields
- Laser Diode With Tunnel Junction Contact Surface Grating
- III-Nitride Tunnel Junction LED with High Wall Plug Efficiency

University of California, Santa Barbara
Office of Technology & Industry Alliances
342 Lagoon Road, Santa Barbara, CA 93106-2055
www.tia.ucsb.edu
Tel: 805-893-2073 | Fax: 805.893.5236 | dobis@tia.ucsb.edu

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