Etching Technique for the Fabrication of Thin (Al, In, Ga)N Layers

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BRIEF DESCRIPTION

A safe etching technique for use with (Al, In, Ga)N materials.

BACKGROUND

Current nitride etching techniques face problems such as damaging sensitive device layers, alteration of quantum well layers and large scale roughening of the etched surface.

DESCRIPTION

Researchers at the University of California, Santa Barbara have developed a safe etching technique for use with (Al, In, Ga)N materials. The method is designed to fabricate free-standing thin nitride wafers or to remove material from thin nitride membranes. It can remove desired material without damaging sensitive device layers, including quantum well layers, and can facilitate the formation of nitride microcavity structures. The technique is applicable to nitride-based optoelectronic and semiconductor devices.

ADVANTAGES

- Selective removal of desired material without damaging sensitive device layers
- Facilitates the formation of nitride microcavity structures for optoelectronic devices

APPLICATIONS

- Nitride-Based Optoelectronic Devices
- Nitride-Based Semiconductor Devices

This technology is available for licensing. See below for a selection of the patents and patent applications related to this invention. Please inquire for full patent portfolio status.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,795,146	09/14/2010	2005-509

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OTHER INFORMATION

KEYWORDS

GaN, Gallium Nitride, indssl, indled, indpec, cenIEE, indfeat

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics
- **Energy**
  - Lighting
- **Semiconductors**
  - Design and Fabrication

RELATED CASES

2005-509-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Lateral Growth Method for Defect Reduction of Semipolar Nitride Films
- Vertical Cavity Surface-Emitting Lasers with Continuous Wave Operation
- Aluminum-cladding-free Nonpolar III-Nitride LEDs and LDs
- Defect Reduction in GaN films using in-situ SiNx Nanomask
- Enhanced Light Extraction LED with a Tunnel Junction Contact Wafer Bonded to a Conductive Oxide
- Transparent Mirrorless (TML) LEDs
- Optimization of Laser Bar Orientation for Nonpolar Laser Diodes
- Method for Enhancing Growth of Semipolar Nitride Devices
- Improved Fabrication of Nonpolar InGaN Thin Films, Heterostructures, and Devices
- Growth of High-Quality, Thick, Non-Polar M-Plane GaN Films
- Technique for the Nitride Growth of Semipolar Thin Films, Heterostructures, and Semiconductor Devices
- MOCVD Growth of Planar Non-Polar M-Plane Gallium Nitride
- Methods for Fabricating III-Nitride Tunnel Junction Devices
- Contact Architectures for Tunnel Junction Devices
- Semi-polar LED/LD Devices on Relaxed Template with Misfit Dislocation at Hetero-interface
- Semipolar-Based Yellow, Green, Blue LEDs with Improved Performance
- Growth of Semipolar III-V Nitride Films with Lower Defect Density
- III-Nitride Tunnel Junction LED with High Wall Plug Efficiency
- Cleaved Facet Edge-Emitting Laser Diodes Grown on Semipolar GaN
- Growth of High-Performance M-plane GaN Optical Devices
- Improved Anisotropic Strain Control in Semipolar Nitride Devices
- Method for Increasing GaN Substrate Area in Nitride Devices
- Limiting Strain-Relaxation in III-Nitride Heterostructures by Substrate Patterning
- Growth of Planar Semi-Polar Gallium Nitride
- Defect Reduction of Non-Polar and Semi-Polar III-Nitrides
- Enhancing Growth of Semipolar (Al,In,Ga,B)N Films via MOCVD

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