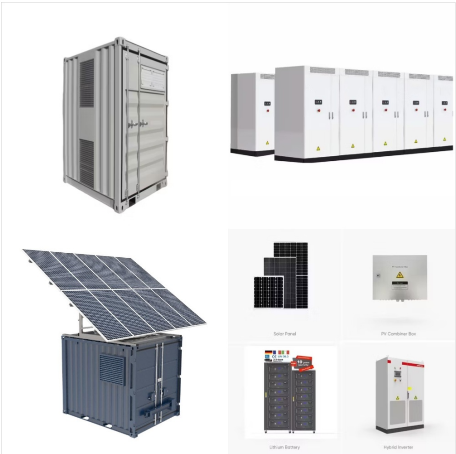
The process of the scratch-induced selective etching in $H_2SO_4/H_2O_2/H_2O$ solution. With an AFM, two scanning modes, i.e. line and area scanning, were used for scratching on GaAs surface, and then the scanned surface was etched in the mixed solution. AFM images show the scanned GaAs surface before and after selective etching.

3 Department of Materials Science and Engineering, Massachusetts Institute of Technology, Massachusetts 02139, Selective defect etching was used to estimate the etch pit density J. Faucher, and M. L. Lee, "Defect selective etching of GaAsyP1???y photovoltaic materials," J. Cryst. Growth 404, 140???145 (2014).

where y???etching rate, X_1, X_2, X_3 ???the concentration of etchant components in the solution ($(NH_4)_2Cr_2O_7$, HBr and EG, accordingly), k_1 ???k_{15} ???parameters of the model (Cornell 1986).. The dependence of the etch rate on the modifier concentration was considered for the range 0???95 vol.% $CH_2(OH)CH_2(OH)$.. Etch rate was estimated by the electronic ???

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS



A defect selective wet chemical etching technique that allows accurate determination of etch pit density (EPD) in thin Germanium (Ge) layers is described. The effect is achieved by using chromium

It is essential to know the etching mechanisms to understand and predict material-selective etching. The chapter also discusses the resulting macroscopic (that is, at single crystal faces) as well

The notes include data on materials, etch rates and specific etch conditions when possible. material selective etchants, defect revealing etchants, profile etching; Ref. (Notten, P.H.L., 1993) III???V semiconductor etchant review: gives pre-1962 ???

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

papers concentrates on etching of crystal defects. These papers are often based on the A-B etch [1] or H-etch [2] or combinations and variations thereof. Some of the more recent papers on defect etching are by Thiel and Barns [3], Kotani et al. [4] and Brown etal. [5]. This.group is obviously

THEORETICAL FUNDAMENTALS AND EXPERIMENTAL MATERIALS AND DEFECT STUDIES USING QUANTITATIVE SCANNING ELECTRON MICROSCOPY-CATHODOLUMINESCENCE/ELECTRON BEAM INDUCED CURRENT ON COMPOUND SEMICONDUCTORS. Defect selective etching of GaAsyP1???y photovoltaic materials. K. N. ???

Two approaches to defect-selective etching used for revealing and analysis of defects in GaN and SiC are described and critically evaluated. J. L. Weyher, C. Frigeri, S. M?ller, in Microprobe characterization of optoelectronic materials, edited by J. Jimenez, (Taylor and Francis, New York, London, 2003), p. 595 [33] Nowak, G. et al., J

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

Rapid and accurate threading dislocation density (TDD) characterization of direct-gap GaAs y P 1???y photovoltaic materials using molten KOH defect selective etching (DSE) is demonstrated. TDDs measured using molten KOH DSE show close agreement with those from both electron beam-induced current mapping and planar view transmission electron ???

Controlling the electrical properties of SiC requires knowledge of the nature and properties of extended defects. We have employed orthodox defect-selective etching and photo-etching methods to reveal typical and new structural defects in commercial SiC wafers. For photo-etching, the etch rate increases as the free carrier concentration decreases. The etch rate can ???

It is found that the etch pits revealed by molten KOH etching on the (001) GaAs surface have definitely different shapes depending on the Burgers vectors of the dislocations. The round hexagonal etch pit corresponds to a dislocation with Burgers vector of 1/2 a???101??? inclined to the (001) plane, while the small round square etch pit corresponds to a dislocation with Burgers ???

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Semantic Scholar extracted view of "Dislocation Etch Pits in Single Crystal GaAs" by J. Grabmaier et al. Physics, Materials Science; Physica Status Solidi B-basic Solid State Physics; View via Publisher. Save to Library Save. Create Alert Alert. Cite. Share. 78 ???

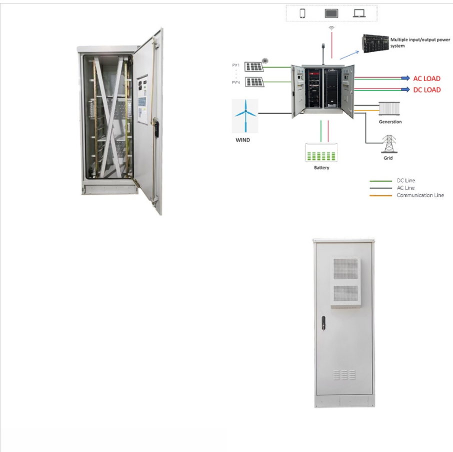
These materials are characterized by very high chemical resistance to the majority of the known acid-based etching systems, show strong Defect-Selective Etching of Semiconductors 43.1 Wet Etching of Semiconductors: Mechanisms 1455 hv V I WE RE CE Fig.43.1 A schematic view of a three-electrode elec-

Rapid and accurate threading dislocation density (TDD) characterization of direct-gap GaAs y P 1???y photovoltaic materials using molten KOH defect selective etching (DSE) is demonstrated. TDDs measured using molten KOH DSE show close agreement with those from both electron beam-induced current mapping and planar view transmission electron microscopy, provided ???

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

Owing to its unique optical properties, light-trapping structure plays a more and more important role in photovoltaic devices [].At present, researchers have developed all kinds of nanostructures as light-trapping structures to increase light absorption in photovoltaics, while most of them were performed on Si substrate [2,3,4,5,6].III???V compound semiconductor ???

SiC; the etch depth of the perfect SiC matrix was 100 nm. These defects are not observed on polished surfaces before etching. Some hexagonal defects, such as the one indicated by the arrow, show complex morphology. A magnied view of the boundary of this non-homogeneously etched area is shown in Fig. 1b. The etch depth prole along the y???y'' line



GaAsyP1-y anion-sublattice compositionally graded buffers and device structures were grown directly on Si(100) substrates by way of a high-quality GaP integration layer, yielding GaAsP ???

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

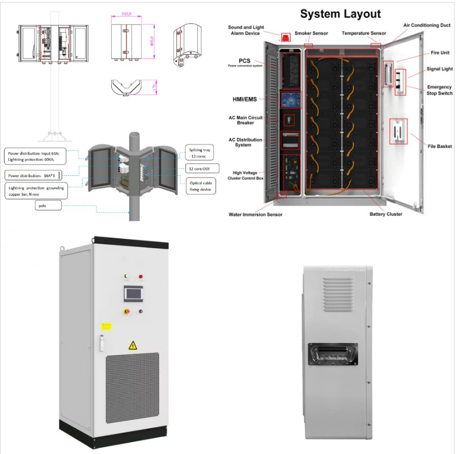
Physical Review B???Condensed Matter and Materials Physics 78 (3), 035201, 2008. 31: S Tomasulo, KN Yaung, ML Lee. IEEE Journal of Photovoltaics 2 (1), 56-61, 2012. 29: 2012: Simultaneous large mode index and high quality factor in infrared hyperbolic metamaterials Defect selective etching of GaAsyP1??? y photovoltaic materials. KN

In the present chapter we first briefly consider mechanisms for the etching of semiconductors (Sect. 43.1) and relate these principles to methods for controlling surface morphology and revealing defects (Sect. 43.2).Section 43.3 describes in some detail defect-sensitive etching methods. Results are presented for the classical (orthodox) method used for revealing ???

DOI: 10.1016/J.JCRYSGRO.2016.08.015 Corpus ID: 99891786; Threading dislocation density characterization in III???V photovoltaic materials by electron channeling contrast imaging

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

Rapid and accurate threading dislocation density (TDD) characterization of direct-gap GaAs y P 1-y photovoltaic materials using molten KOH defect selective etching (DSE) is demonstrated.



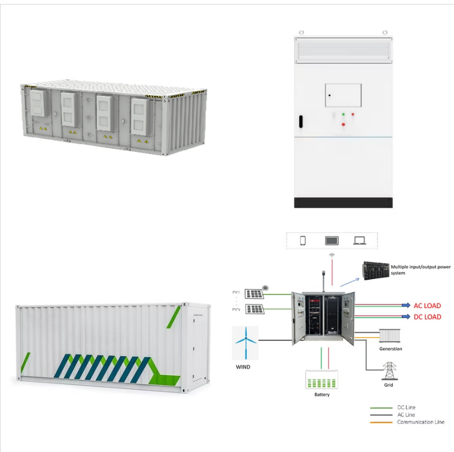
A method is reported in order to determine an upper bound for the Threading Dislocation (TD) density in experimental GaAs solar cells grown lattice-mismatched on Si. The method is based on the modeling of the devices'' External Quantum Efficiency (EQE), using the classic drift-diffusion model, or Hovel model. The model is fitted to experimental EQE ???

The etching rate on a {001} plane of GaAs in molten KOH as the etchant is examined in order to reveal etch pits corresponding to dislocations for thin GaAs layers. The mean etching rates were 0.083 um/min. and 0.98 um/min. at 300?C and 350?C, respectively. It was found that the etching thickness of about 0.3 um was sufficient to reveal the dislocation structure.

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

Solar Energy Materials and Solar Cells. 2019; 33. PDF. Defect selective etching of GaAsyP1???y photovoltaic materials. K. N. Yaung S. Tomasulo J. R. Lang J. Faucher M. Lee. Materials Science, Physics. 2014; 14. Save. 40.8% efficient inverted triple-junction solar cell with two independently metamorphic junctions.

Plan-view transmission electron microscopy (PVTEM), electron beam-induced current (EBIC), cathodoluminescence (CL), and defect selective etching (DSE) are commonly used to obtain TDD, with well-known advantages and disadvantages (Table 1) [10].PVTEM has been a commonly used technique due to its ability to clearly distinguish various types of ???



Control of defect processes in photovoltaic materials is essential for realizing high-efficiency solar cells and related optoelectronic devices. Native defects and extrinsic dopants tune the Fermi

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

Prototype GaAsP solar cell test devices grown on anion-sublattice step-graded GaAs y P 1-y buffers on early-stage GaP/Si substrates show good preliminary performance characteristics ???

Metamorphic growth of InAsSb layers on GaAs substrate can solve this limitation and allow cost-competitiveness compared to the high-cost substrates such as GaSb and InAs [4], [5], [6].Early attempts to do this involved the direct growth of the InAsSb layer on a GaAs substrate, and more recently, the use of a single intermediate InSb layer without any strain ???

In this study, we demonstrate a new method to selectively etch the point defects or the boundaries of as-grown hexagonal boron nitride (hBN) films and flakes in situ on copper substrates using hydrogen and argon gases. The initial quality of the chemical vapor deposition-grown hBN films and flakes was confirmed by UV???vis absorption spectroscopy, atomic force ???

DEFECT SELECTIVE ETCHING OF GAASYP1 Y PHOTOVOLTAIC MATERIALS

Rapid and accurate threading dislocation density (TDD) characterization of direct-gap GaAs y P 1???y photovoltaic materials using molten KOH defect selective etching (DSE) is demonstrated.