Porous Silicon Electrical And Optical Biosensors

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Michael J. Sailor: Porous Silicon Nanoparticles as Self-Reporting Drug Delivery Vehicles

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Production of Porous Silicon - Pharmaceutical Physics Group Presentation VideoThe Evolution of Computing (Vacuum Tube to Transistor to Integrated Circuit) [Documentary] Strong light-matter coupling in 2D materials | Vinod Menon **OPTICAL PROPERTIES** *Eric Bogatin on Breaking Bad: A Downside of Open Source Designs - AltiumLive Keynote Wal Thornhill: Stars in an Electric Universe |□ NPA/EU 2011* From Sand to Silicon: the Making of a Chip | Intel David Sinclair - Cracking \u0026 reversing the aging clock - Science Unlimited 2019 Transistors, How do they work ? *Electrical \u0026 Mechanical properties of Nanoparticles* Prof. George Church - The Augmented Human Being *The Power and Potential of Silicon* Birth of The Transistor: A video history of Japan's electronic industry. (Part 1) **C8 Why is Silicon a Semiconductor? [HL IB Chemistry]** Pioneering gene-editing | George Church \u0026 Chris Smith S3-E1 - Silicon Photonics webinar series - Silicon Nitride MPWs and why a PIC is more than a chip William Johnson | Science and Technology of Metallic Glasses **Silicon - The Internet's Favorite Element: Crash Course Chemistry #35** 5 Types of Awesome Glass Made by Nature *Nanotechnology: How it is Changing Society*

2.5D Heterogenous Silicon Photonics Light Engine with Integrated DFB Lasers and Electronics Boron nitride based nanostructured materials: molecules, polymers, nano-objects..... Optical Isomers (Stereo Isomers) | □□□□ □□ □□□□□□ □□□□□ □□ □□□□ | Organic Chemistry | NEET JEE AIIMS *George Church - The Future of Humanity | Xapiens Symposium* **Porous Silicon Electrical And Optical**

Electrical transport measurement shows that these nanowires are conductive and optical studies indicate that they can exhibit visible luminescence. The combination of electrical and optical properties in such a porous silicon nanowire may open new opportunities for nanoscale optoelectronic devices, solar energy harvesting and conversion and sensors.

Electrically Conductive and Optically Active Porous ...

At a sufficient doping level, the porous silicon can be highly conductive and thus responsive to analytes in the electrical domain in parallel with optical signals, providing a basis for multiparametric sensing.

Porous Silicon Structures as Optical Gas Sensors

Porous silicon—a substance which is produced by a treatment of Si wafers in hydrofluoric acid solutions was known since the fifties due to the works by Uhrlir Turner , Memming and Schwandt . The material was considered as suitable for electronic applications (local insulation, gettering of impurities, sacrificial layers, etc.) but never in relation with optical applications.

Porous silicon—mechanisms of growth and applications ...

Porous silicon (P-Si) is a suitable material for applications in gas sensors, biomedical sensors and optical sensors. In this work, the effects of humidity and acetone on the optical and electrical properties of porous silicon nanostructures, produced by two different methods, are studied.

Effects of humidity and acetone on the optical and ...

Yliniemi, S. (1998). Photoluminescent and optical properties of porous silicon.In J. Sinkkonen (Ed.), Light Emission from Silicon-Porous Silicon (pp. 93-116).Electron Physics Laboratory.

Photoluminescent and optical properties of porous silicon ...

Organic semiconductors have recently gained more attention due to their electrical properties and flexibility for combining with other materials, mainly with inorganic semiconductors (silicon). In this work we fabricated heterostructures based on Erbium phthalocyanine (ErPc) on porous silicon (PS) and crystalline silicon (c-Si).

Erbium phthalocyanine on porous silicon: Morphological ...

The simple adjustment of pore morphology and geometry of porous silicon also offers a convenient way to control its wetting behavior. Stable ultra- and superhydrophobic states on porous silicon can be fabricated and used in lab-on-a-chip, microfluidic devices for the improved surface-based bioanalysis. Optical properties

Porous silicon - Wikipedia

The reversibility, specificity, stability, and scaling of signal response to analyte mass were quantified for a porous silicon-based optical interferometric biosensor. The sensor system studied consisted of a thin layer (5μm) of porous silicon modified with Protein A. The system was probed with various fragments of an aqueous Human IgG analyte.

A Porous Silicon Optical Biosensor: Detection of ...

Arik Kar, Amitava Patra, Optical and Electrical Properties of Eu 3+ -Doped SnO 2 Nanocrystals , The Journal of Physical Chemistry C, 10.1021/jp810777f, 113, 11, (4375-4380), (2009). Crossref Hai Jun Xu, Xin Jian Li, Rectification effect and electron transport property of CdS/Si nanoheterostructure based on silicon nanoporous pillar array, Applied Physics Letters, 10.1063/1.3002297, 93 , 17 ...

Structural, optical and electrical properties of porous ...

All these steps were necessary to achieve our main and final objective: the fabrication of porous silicon multilayer optical devices. The optical devices fabricated with porous silicon multilayers are Distributed Bragg Reflectors, microcavities (with applications as humidity sensors) and omnidireccional mirrors with structures different to the ones used until this moment that optimize their optical characteristics.

Design, fabrication and characterization of porous silicon ...

The porous silicon (PSi), which is produced by the electrochemical etching, has been used as a substrate for the growth of the titanium oxide (TiO2) thin films. By using the EBPVD method, TiO2 ...

(PDF) Structural, Optical and Electrical Properties of ZnS ...

Book Description. Porous silicon is rapidly attracting increasing interest from various fields, including optoelectronics, microelectronics, photonics, medicine, sensor and energy technologies, chemistry, and biosensing. This nanostructured and biodegradable material has a range of unique properties that make it ideal for many applications.

Porous Silicon: From Formation to Applications ...

A porous silicon-based optical interferometric biosensor. A biosensor has been developed based on induced wavelength shifts in the Fabry-Perot fringes in the visible-light reflection spectrum of appropriately derivatized thin films of porous silicon semiconductors. Binding of molecules induced changes in the refractive index of the porous silicon.

A porous silicon-based optical interferometric biosensor

2.1 Preparation of the porous silicon substrate The silicon samples used in this study were cut into 5 x 5 mm2 squares, from single crystal silicon wafer. The porous silicon (PS) layers are formed on n type (100) c-wafers with resistivity of 1-10 Ω.cm and thickness of 500 -550μm using the electrochemical anodization.

Experimental study of optical and electrical properties of ...

Surface, optical and electrical properties are highly dependent on particle size, doping of different materials and so on. Porous structures in silicon nanomaterials not only improve the specific surface area, adsorption, and photoluminescence efficiency but also provide numbers of voids as well as the high surface to volume ratio and enhance the adsorption ability. In this review, we focus on the significance of porous silicon/mesoporous silicon nanoparticles (pSiNPs/mSiNPs) in the ...

Big Potential From Silicon-Based Porous Nanomaterials: In ...

Porous silicon (PS) is a semiconductor in nanocrystalline form (NPS), which could improve some properties of silicon, given that some properties, such as the electricals, are determined by the short range order of atoms, rather than by the long range

Nanocrystalline Porous Silicon: Structural, Optical ...

Here, the improvement in optical properties of porous SiC/Si is reported by optimization of etching current density in electrochemical anodization of SiC layers on Si substrates. It is shown that the porosity and optical properties of porous SiC thin films on silicon substrates can be improved by optimization of etching current density.

Ultra-sensitive UV sensors based on porous silicon carbide ...

A very large surface to volume ratio of nanoporous silicon (PS) produces a high density of surface states, which are responsible for uncontrolled oxidation of the PS surface. Hence it disturbs the stability of the material and also creates difficulties in the formation of a reliable electrical contact. To passivate the surface states of the nanoporous silicon, hydrocarbon films prepared by ...

Electrical and optical properties of annealed plasma ...

Organic semiconductors have recently gained more attention due to their electrical properties and flexibility for combining with other materials, mainly with inorganic semiconductors (silicon). In...

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