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Device Applications of Silicon Nanocrystals and ...

In addition to efficient visible luminescence, various other useful material functions are induced in nanocrystalline silicon and periodic silicon nanostructures. Some novel devices and applications, in fields such as photonics (electroluminescence diode, microcavity, and waveguide), electronics (single-electron device, spin transistor, nonvolatile memory, and ballistic electron emitter), acoustics, and biology, have been developed by the use of these quantum-induced functions in ways ...

Device Applications of Silicon Nanocrystals and ...

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The literature mostly reports the application of silicon (Si) nanocrystals in various semiconductor devices and structures, e.g., field-effect light-emitting devices (FELEDs), photovoltaic cells, memory structures based on photoluminescence (PL), or non-volatile semiconductor memory (NVSM) devices [5,6].

Device Applications Of Silicon Nanocrystals And ...

"Device Applications of Silicon Nanocrystals and Nanostructures" por disponible en Rakuten Kobo. Recent developments in the technology of silicon nanocrystals and silicon nanostructures, where quantum-size effects are... Device Applications of Silicon Nanocrystals and ... Silicon-based device solutions have been demonstrated for planar waveguides and for high-

Device Applications Of Silicon Nanocrystals And ...

Research in silicon nanocrystals (Si NCs) has over thirty years of history; nevertheless, it still attracts significant attention today. Initially, a great effort was devoted to extending the use of silicon in optoelectronics for the realization of Si-based light-emitting devices, especially lasers.

Nanomaterials | Special Issue : Silicon Nanocrystals: From ...

The continuous improvement of the electronic and optical properties of Si NCs has been enabled by manipulating the size, surface and doping of Si NCs. The use of Si NCs for optoelectronic devices such as light-emitting diodes, solar cells, photodetectors and synaptic devices have been explored in the past years.

Silicon nanocrystals: unfading silicon materials for ...

Silicon nanocrystals (SiNCs) with bright bandgap

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photoluminescence (PL) are of current interest for a range of potential applications, from solar windows to biomedical contrast agents. Here, we use the liquid precursor cyclohexasilane (Si₆H₁₂) for the plasma synthesis of colloidal SiNCs with exemplary core emission.

Bright Silicon Nanocrystals from a Liquid Precursor: Quasi ...

The literature mostly reports the application of silicon (Si) nanocrystals in various semiconductor devices and structures, e.g., field-effect light-emitting devices (FELEDs), photovoltaic cells, memory structures based on photoluminescence (PL), or non-volatile semiconductor memory (NVSM) devices [5,6].

Silicon-Carbide (SiC) Nanocrystal Technology and ...

The improved electronic properties yielded by nanostructured silicon in comparison to its bulk counterpart have led, during the last few decades, to the in-depth investigation of their underlying fundamentals, in order to optimize their performance to be applied in the electronics and optoelectronics fields.

Silicon nanocrystals-based electroluminescent resistive ...

Silicon nanocrystals (SiNCs) featuring size-dependent novel optical and electrical properties have been widely employed for various functional devices. We have demonstrated SiNC-based hybrid photovoltaics (SiNC-HPVs) and proposed several approaches for performance promotion. Recently, owing to the superiorities such as low power operation, high portability, and designability, organic photovoltaics (OPVs) have been extensively studied for their potential indoor applications as power sources.

Silicon nanocrystal hybrid photovoltaic devices for indoor ...

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device fabrication. It is used for almost all modern electronic devices. However, the indirect energy gap in bulk crystalline Si makes it unable to emit light efficiently and thus unsuitable for optoelectronic applications. For example, lasers, photodetectors are not constructed from silicon.

[Silicon Nanocrystals - cdn.intechopen.com](http://cdn.intechopen.com)

Silicon nanocrystals can also be used as the floating gate in a flash memory device, and work is also presented examining charge transport in novel systems for flash memory applications. To explore silicon nanocrystals as a potential replacement for metallic floating gates in flash memory, the charging dynamics in silicon nanocrystal films are first studied using UHV-AFM.

[Electron Transport in Silicon Nanocrystal Devices: From ...](#)

The application of Si nanocrystals as floating gate in the metal oxide semiconductor field-effect transistor (MOSFET) based memory, which brings many advantages due to separated charge storage, attracted much attention in recent years.

[SILICON NANOCRYSTAL CHARGING DYNAMICS AND MEMORY DEVICE ...](#)

We demonstrate hybrid inorganic-organic light-emitting devices with peak electroluminescence (EL) at a wavelength of 868 nm using silicon nanocrystals (SiNCs). An external quantum efficiency of 0.6% is realized in the forward-emitted direction, with emission originating primarily from the SiNCs. Microscopic characterization indicates that complete coverage of the SiNCs on the conjugated ...

[Hybrid Silicon Nanocrystal - Organic Light-Emitting Devices](#)

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Silicon nanocrystals (Si NCs) are used to fabricate optoelectronic synaptic devices whose energy consumption may be rather low. Essential synaptic functionalities have been realized in these devices by using broadband light to stimulate them.

Broadband optoelectronic synaptic devices based on silicon

...

Silicon nanocrystals are also of interest for applications in solid state lighting. While bulk silicon shows basically no photoluminescence due to its indirect band-gap, strong photoluminescence has been demonstrated for silicon nanocrystals even at room 4Author to whom any correspondence should be addressed.

Plasma synthesis of single-crystal silicon nanoparticles ...

The application of Si nanocrystals as floating gate in the MOSFET-based memory brings many advantages due to separated charge storage. In this work, Si nanocrystal memory with nanocrystals synthesized by ion implantation was characterized to provide better understanding of the relationship between device structure and performance---especially charge retention characteristics.

Silicon nanocrystal charging dynamics and memory device ...

New high-tack silicone adhesive offers the re-positionable, gentle properties of silicone while achieving up to four-day wear time and supporting heavy devices. PlasticsToday Staff | Dec 14, 2020 Currently available acrylate and silicone adhesives typically require device engineers to choose between strength and wear duration, or comfort and ...

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