Flexible near infrared photovoltaic devices based on plasmonic liu

Liu D, Yang D, Gao Y, et al. Flexible near-infrared photovoltaic devices based on plasmonic hot electron injection into silicon nanowire arrays. Angew Chem Int Ed, 2016, 55: 4577-4581 ... W. Plasmonic materials for flexible near-infrared photovoltaic devices. Sci. China Mater. 59, 410-411 (2016) . https://doi ...

Two-dimensional materials (2DMs) have been used widely in constructing photodetectors (PDs) because of their advantages in flexible integration and ultrabroad operation wavelength range.

Of the plasmonic materials, the noble metals, particularly silver and gold, are those most often used owing to their relatively low loss. However, the optical loss of the two metals is still not ...

Flexible Near-Infrared Photovoltaic Devices Based on Plasmonic Hot-Electron Injection into Silicon Nanowire Arrays. Angewandte Chemie 2016, 128 (14), 4653-4657. DOI: 10.1002/ange.201600279. Dong Liu, Dong Yang, Yang Gao, Jun Ma, Ran Long, Chengming Wang, Yujie Xiong.

The flexible devices were fixed onto two X-Y mechanical stages (Figure S14). Different bending angles were tuned by changing the distance between two stages. As shown in Figure 5 D, the current enhancements at 1 and 5 s exhibited no obvious changes. After continuously bending to 150° for 1,000 cycles, the flexible devices remained unchanged in ...

This page is a summary of: Flexible Near-Infrared Photovoltaic Devices Based on Plasmonic Hot-Electron Injection into Silicon Nanowire Arrays, Angewandte Chemie International Edition, ...

In the past few decades, flexible near-infrared (NIR) photodetectors have attracted significant attention in imaging, data communication, environmental monitoring, and bioimaging applications [1-4].However, scalability, sensitivity and mechanical stability challenge the selection of channel semiconductors and device fabrication of flexible NIR photodetectors [].

We report on the coupling of ZnO nanoparticles with plasmonic gold nanoislands in a solution-processed photodetector, which results in a clear enhancement in the optical absorption and the electrical responsivity of ZnO nanoparticles, to cover the visible and the near-IR (NIR) spectral range, well beyond its intrinsic optical absorption.

This work separately form the tunneling metal-insulator-metal (MIM) junction for electron collection and the plasmon exciting MIM structure on top of each other, which provides high flexibility in plAsmonic design and tunneling MIM design separately. Hot electron photovoltaics is emerging as a candidate for low cost and ultra thin solar cells. Plasmonic ...

The lightweight, flexible nature of these devices, designable optoelectronic property, and ability to be

integrated with complex geometries [25], position flexible NIR OPDs and arrays as ideal elements in advanced wearable systems, with a wide array of application scenarios in health monitoring, diagnostic imaging, and human-environment ...

We have developed an approach to improve the quantum efficiency of flexible PV devices in the NIR spectral region by integrating Si nanowire arrays with plasmonic Ag nanoplates. The Ag ...

Plasmonics enables the manipulation of light beyond the optical diffraction limit1,2,3,4 and may therefore confer advantages in applications such as photonic devices5,6,7, optical cloaking8,9 ...

Enhanced near-infrared photoresponse for efficient organic solar cells using hybrid plasmonic nanostructures ... and AuNSs was used to achieve a broadband improvement of absorption both in the visible and NIR regions in OSCs via the near-field plasmonic enhancement and scattering effect. ... J-V curves for control device based on PBDB-T:ITIC ...

Perovskite solar cells (PSCs) have garnered immense attention in recent years due to their outstanding optoelectronic properties and cost-effective fabrication methods, establishing them as promising candidates for next-generation photovoltaic technologies. Among the diverse strategies aimed at enhancing the power conversion efficiency (PCE) of PSCs, the ...

Interfaces of organic donor-acceptor blends provide intermolecular charge-transfer states with red-shifted but weak absorption. By introducing an optical micro-cavity; Siegmundet al., enhance ...

Organic electronics offers a range of versatile features, including low-cost roll-to-roll production 1,2, easy integration with other systems and device flexibility 3,4.Recently, organic devices ...

The development of flexible near-infrared (NIR) photovoltaic (PV) devices containing silicon meets the strong demands for solar utilization, portability, and sustainable ...

We have developed an approach to improve the quantum efficiency of flexible PV devices in the NIR spectral region by integrating Si nanowire arrays with plasmonic Ag ...

The Ag nanoplates can directly harvest and convert NIR light into plasmonic hot electrons for injection into Si, while the Si nanowire arrays allow light trapping. The flexible ...

The challenges in transparent photovoltaic (TPV) fields are still that the device transparency and efficiency are difficult to be balanced to meet the requirements of practical applications.

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We propose a plasmonic effect-assisted pyroelectric detector covered by an inhomogeneous Al metasurface, which exhibits ultrafast response speed and extended near-infrared response spectrum.

The development of flexible near-infrared (NIR) photovoltaic (PV) devices containing silicon meets the strong demands for solar utilization, portability, and sustainable manufacture; however ...

Flexible friend: The quantum efficiency of flexible photovoltaic devices in the near-infrared spectral region has been improved by integrating Si nanowire arrays with plasmonic Ag nanoplates.The Ag nanoplates can directly harvest and convert NIR light into plasmonic hot electrons for injection into Si, while the Si nanowire arrays allow light trapping.

This review article surveys the potential of using plasmonic nanostructures to enhance the absorption of photovoltaic devices. As a result, the physical thickness of solar cells can be reduced ...

Xiong recently developed a flexible NIR photovoltaic device by coupling Si nanowires with an Ag-nanoplate-based plasmonic antenna which possesses a surface plasmon extinction band ranging from 550 to 1100 nm [21]. Song reported an Ag NW-net plasmonic antenna exhibits super wide surface plasmon extinction from 350 to 3000 nm [22].

Plasmonic antennas based on metallic nanostructures that can trap long-wavelength light can be used to substantially enhance the efficiency of optoelectronic devices by utilizing light beyond the visible region. This study experimentally and theoretically demonstrates that a silver nanowire network (AgNW-net) plasmonic antenna exhibits ...

Semantic Scholar extracted view of "Nanoparticle-based plasmonic organic photovoltaic devices" by E. Stratakis et al. ... alternative plasmonic material to nanoparticulate gold due to its strong plasmonic resonances in both the visible and near-infrared (NIR) regions. ... Expand. 4 [PDF] ... Kong Liu Yu Bi +6 authors Z. Wang. Materials Science ...

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In the following, we highlight three strategies that utilize plasmonic effects therefore, involving 1) the near field enhancement of plasmonic particles and energy transfer to proximal (semiconductor) species leading to photocurrent, 2) the transfer of hot carriers to peripheral species inducing photocurrent and 3) detection based

on heating ...

Flexible friend: The quantum efficiency of flexible photovoltaic devices in the near-infrared spectral region has been improved by integrating Si nanowire arrays with plasmonic Ag nanoplates. The Ag ...