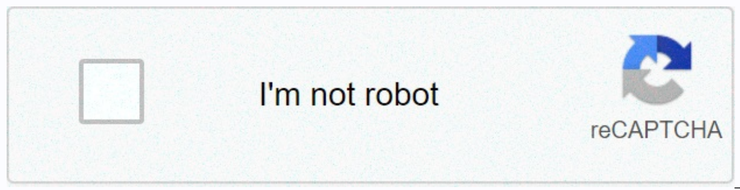

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Surface enhanced raman spectroscopy gold nanoparticles

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Here, we show that a library of MRI/FI nanoprobs can be generated through three orthogonal assembly processes: encapsulation of magnetic nanoparticles (MNP) into phospholipids and phospholipid-PEG copolymers, physical adsorption of alkylcarbocianine dyes, and superficial bioconsunation of targeting ligands. The three molecular assembly processes can be optimized independently, facilitating the development of individual nanoprobenne components. In particular, DiI/DiR/MNP nanoprobs provide stable and high signal contrast in full-body MAGNETIC RESONANCE, near-infrared fluorescence imaging in vivo/ex vivo and fluorescence microscopy, demonstrating the potential applications of nanoprobs in consistent tumor diagnostic imaging, intraoperative imaging, and tumor biopsy. Our approach provides a general lipid-based nanofabrication strategy for the rational design of multimodal imaging probes. Page 4Page 5The ability of platonic metal nanostructures (PMNs), such as silver and gold nanoparticles, to manipulate and concentrate electromagnetic fields on a nanoscale is the basis of a wide range of applications, including nanoscale optics, solar energy collection, and photocatalysis. However, there are inherent problems associated with platonic metals, such as high ohmic losses and poor compatibility with traditional metal-oxide-semiconductor (CMOS) microfabrication complementary processes. These limitations inhibit the wider use of PMNs in practical applications. Here, we report that cubic particles of submicrometric cuprometer oxide (Cu2O) may show strong electrical and magnetic resonances with transverse sections of extinction/dispersion comparable to or slightly higher than those of Ag particles. Particle synthesis techniques that control dimensions and shapes, optical spectroscopy, and time domain simulations unlike finite, we show that Mie resonance wavelengths are dependent on size and shape, and tuna in regions visible to near infrared. Infrared. Cu2O submicrometer cubic particles can potentially emerge as high-performance alternatives to PMNs. The strong nanoantenna attribute mediated by my electric and magnetic resonance imaging of Cu2O cubic particles can potentially be used in a wide range of applications, including nanoscale optics, surface-enhanced Raman spectroscopy, surface-enhanced infrared absorption spectroscopy, photocatalysis, and photovoltaics. Page 6Page 7Herein, we demonstrate a simple, highly efficient and cost-effective clean water generation strategy that can be implemented in geographical locations deprived of freshwater resources. We captured and purified atmospheric water using CaCl2 as a deliquescent material followed by solar thermal desalination with an engineered photothermal nanocomposite sheet (E-PNS). E-PNS was prepared using Mn2+ tio2-rich black anatase-rich nanoparticles such as fillers and polys (vinylidene fluoride) as a polymer matrix. The developed E-PNS shows excellent radiation absorption of ∼98.5% covering the entire solar spectrum (250-2500 nm) and has interconnected micropores that facilitate efficient solar-thermal heat and mass transfer. Therefore, the reported clean water generation strategy achieves a high solar-thermal conversion efficiency of 90% under light irradiation (solar simulator, intensity 1.13 kW m-2), which is 2.2 times higher than the water itself. In addition, real-time analysis of an E-PNS integrated all-in-one water generator prototype showed a clean water generation rate of 0.365 kg m-2 h-1, i.e. ∼2.2 L m–2 day-1, under direct solar irradiation (∼1.06 kW m-2), thus offering a very promising technological solution for the production of clean water in water-scarce regions. Page 8The nanoparticles of planeine (Pt) (NP) supported on mesoporous graphite carbon nitride (mpg-CN/Pt) have been synthesized in situ by reducing mpg-CN/Pt(IV) composites prepared during catalytic hydrolysis of ammonia-borane (AB) under white light irradiation. The mpg-CN/Pt nanocatalymeters produced have been characterized by the use of many advanced analytical techniques including TEM, XRD, ICP-MS, XPS, FTIR, PL and time-resolved emission spectroscopy (TRES). In addition to the advantageous privilege of the in situ synthesis protocol presented for the synthesis of mpg-CN/Pt nanocatalyses, the formation of heterojunction between in situ-generated PNP Pt and mpg-CN visible light active semiconductor allows better separation of charge and prolonged duration, resulting in increased photocatalytic activity 2.25 times within ab hydrolysis under light irradiation The effect of pt load on catalytic activity of mpg-CN/Pt nanocatalometers was examined in AB hydrolysis and the highest turnover frequency (TOF) of 274.2 min-1 was obtained with 5.94 wt % pt-load pt-load nanocatalysts, which is one of the best TOFs among Pt-based monometallic nanocatalysts comparable to those reported using bimetallic Pt nanocatalysts. In addition, mpg-CN/Pt nanocatalometers were found to be highly durable in AB hydrolysis in such a way as to preserve 78% of its initial catalytic activity after the 10th consecutive series, which is one of the highest reusability performance among all Pt-based catalysts that have been tested so far in AB hydrolysis. On the results of kinetic studies, the law on rates and activation parameters for hydrolysis AB catalyzed by mpg-CN/Pt have also been reported. This work demonstrates for the first time that mpg-CN is an adequate support material for the in situ synthesis of catalytically active but stable PNP Pt that promote the photocatalytic evolution of hydrogen from AB hydrolysis. Page 9Page 10Page 11Page 12A large third-order nonlinear-optical response of palladium diselenide films (PdSe2), a two-dimensional noble metal (2D) dicalcogenide material. Both open-opening (OA) and closed-aperture (CA) Z-scan measurements are performed with an 800 nm femtosecond pulsed laser to investigate nonlinear absorption and nonlinear refraction, respectively. In the OA experiment, we observe an optical limitation behavior originating from a large absorption of two photons (TPA) in the film PdSe2 of β = 3.26 × 10-8 m/W. In the CA experiment, we measure a peak-valley response corresponding to a large and negative Kerr nonlinear response of n2 = −1.33 × 10-15 m2/W, 2 orders of magnitude larger than those of the Mass Si. We also characterize the variation of n2 as a function of laser intensity, noting that n2 decreases in magnitude with incident laser intensity, becoming saturated at n2 = −9.96 × 10-16 m2/W at high intensities. These results verify the extensive third-order nonlinear-optical response of 2D PdSe2 and its strong potential for high-performance non-linear photon devices. 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Other projects==== External links Chem.B 2015, 119, 11879– 11886, DOI: 10.1021/acs.jpcb.5b04350 Page 15Page 16Nanoparticles (NPs) of gallium-based liquid metal alloys (LM) have potential applications in flexible electronics, drug administration and molecular imaging. They can be easily produced using top-down methods such as sonication. However, the sonication process generates heat that can cause PNP dealloying through hydrolysis and gallium oxidation. This limits the sonication power and period that can be applied to disrupt LM in smaller particles with high concentrations. In addition, it remains difficult to achieve the long-term colloidal stability of PNP in biological swabs. Here we develop a dynamic temperature control system to improve performance of the LM PN. Improved performance is reflected in the significant increase in particle concentration, decreased prevention of the formation of oxide nanorodes and the versatility of NP production of different types of alloys. In addition, we design a brushed glycol polyethylene polymer with multiple groups of phosphonic acid to effectively anchor NP. More importantly, we find that phosphate can effectively passively move the surface of PN to further improve its stability. Using these strategies, pnp products remain stable in organic tampons for at least six months. Therefore, the proposed methods can unlock the vast potential of LM PN for biomedical applications. Page 17Ddimensional graphene films and graphene derivatives have attracted widespread interest due to the great potential of optoelectronic applications. However, improving the performance of photodetectors based on graphene films and graphene derivatives remains a major challenge. Replacing graphene films with vertically oriented graphene (VOG), which is then functionalized with graphene quantum dots (GQD), a functional VOG is assembled on the Germanic heterojunction (Ge) (designated as GQDs/VOG/Ge) for near-infrared light detection. The properties of the photodetector are enhanced by the synergistic effects of GQD and VOG with regard to light absorption and electron transport. Vog functional modification is an efficient way to adjust and control vog's fermi level, increase the built-in potential of Schottky joints, and facilitate separation of electron pairs and photoinduced holes. The as-fabricated photodethetic shows excellent responsibility (1.06 × 106 AW-1) and detectability (2.11 × 1014 cm Hz1/2 W–1) at a wavelength of 1550 nm. The photoresponse survey reveals response rates with microsecond increase/fall times as well as excellent long-term reproducibility and stability. The results reveal a simple strategy to manufacture new structures for high-performance graphene-based photodetectors. Page 18LEARN ON THESE METRICSChe article views are the COUNTER-compliant sum of full text article downloads since November 2008 (both PDF and HTML) in all institutions and individuals. These metrics are regularly updated to reflect the usage that has led to the last few days. Citations are the number of other articles that cite this article, calculated by Crossref and updated daily. Learn more about crossref counts. The altmetric attention score is a quantitative measure of the attention that a research article received online. Clicking on the donut icon will upload a altmetric.com page with more details about the score and social media presence for the given item. Learn more about the attention and how the score is calculated. Page 19Let's have a green, low-cost synthesis approach to produce high-performance optoelectronics based on the WS2-decorated pencil track on ordinary cellulose paper. Ordinary. it is noteworthy that the photodetector was prepared via simply un intoxicated WS2 nanosheets processed with solutions, pencil-drawn graphene conduction films and biodegradable papers. WS2/graphene-based portable and flexible electronics show excellent photographic response in a wide spectral region from visible to nearby IR due to plasma enhancement and efficient photoabsorption. Atomically thin exfoliated liquid phase WS2 nanosheets have been decorated on a pencil track conductive film using the electrophoretic deposition technique of large areas. The WS2/graphene heterostructure-based photodethetic shows an excellent time photoresponse with a responsibility of 0.439 A/W, a detectability of 1.41 × 1010 Jones and an external quantum efficiency of 81.39%. High-performance photodethetic shows piezoresisive modulation in electrical transport. The response of the device has been studied up to 500 bending cycles. Finally, this finding supports the great development compared to the previously reported non-biodegradable and small optoelectronic devices. Page 20Page 21Page 22LEARN ON THESE METRICS Article views are the COUNTER-compliant sum of full text article downloads since November 2008 (both PDF and HTML) in all institutions and individuals. These metrics are regularly updated to reflect the usage that has led to the last few days. Citations are the number of other articles that cite this article, calculated by Crossref and updated daily. Learn more about crossref counts. The altmetric attention score is a quantitative measure of the attention that a research article received online. Clicking on the donut icon will upload a altmetric.com page with more details about the score and social media presence for the given item. Learn more about the altmetric attention score and how the score is calculated. Page 23Entable Castilians guide liquid movement in miniature channels and capillaries, which are ubiquitous in the human body, nature and technology; examples include the capillary network of the brain, implants, feeding systems, nanofluidic devices and cooling systems for electronics/ photonics. Capillary force is inversely proportional to the confinement radius and becomes the dominant driving force for mass transport on smaller scales. Here, we demonstrate that capillary absorption breaks down on a sub-10 nm scale for some fluids, changing the governing physics of mass transport and leading to an almost static liquid-vapor interface by experimenting with the dynamic process of wetting and fracturing cyclically. The capillary breakage scale is a function of the interface tension of the liquid and could be tuned according to the requirements of the system. Capillary breakage results in surface tension nanogates that are turned on/off through external stimuli such as minimal temperature drive or applied voltage. These nanogates are effective and tuna-safe for ion transport, playing a fundamental role in the functionality of biological systems. Surface voltage nanogates promise platforms to govern the nanoscale functionality of a wide spectrum of systems, and applications can be predicted in drug administration, energy conversion, power generation, seawater desalination, and ion separation. Page 24Page 25The understanding of platelet-surface activation is of clinical importance because it directly involves the formation of a hemostatic spine or blood clot at vascular injury sites. Although platelet activation has been studied on various structured models, this behavior on nanoscale groove models remains unclear. Here, we fabricated pattern arrays with groove sizes of 100 and 500 nm using electron beam lithography and studied platelet response on these models using scanning electron microscopy and atomic force microscopy. Without modification, the platelets spread stronger on the unschealed and weaker surface on 100 nm grooves, while the diffusion feature decreased significantly on the surfaces modified by the laminin. With a laminin coating, the platelets did not spread after contact for 15 minutes, but the formation of phylopods of different lengths occurred, which is longer on the unrostructed surface and shorter on 100 nm grooves. This difference was related to adhesion forces because the platelets tied stronger, weaker and weaker on the corresponding unstructured surface and nanopatterns of 500 and 100 nm. Our results show that platelet-surface activation depends on the underlying nanostructured surface, and the results can have a major impact on medical applications. Page 26Delectric polymers have excellent flexibility over inorganic ceramic materials. However, the relatively low dielectric constant and working temperature significantly limit their widespread application. Here, we point out an easy low-cost strategy to develop flexible polymer-based composite films with high dielectric constant over a wide temperature. Polyacrylonitrile (PAN) nanofiber mats containing graphene oxide (GO) with core-shell microstructure were first prepared by coaxial electrofilament and then hot pressed into dense composite films. It has been revealed that hot pressing assisted by an appropriate temperature and pressure elongation force can generate local conformational changes of PAN, leading to the formation of an electroactive phase with of the dielectric constant. Meanwhile, GO has turned into reduced graphene oxide (rGO) under heat reduction, acting as conductive nanofillers to further promote the increase in the dielectric constant. As a result, optimized rGO/PAN composites showed thermally stable dielectric properties with a high dielectric constant (ε′ = 23, 80 °C; ε′ = 40, 150 °C) and low loss (tan δ = 0.13, 80 °C; tan δ = 0.55, 150 150 over a wide temperature range. This work offers an efficient method for the synthesis of flexible composite dielectric films that have great potential in high temperature electronic applications. Applications.

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