



2019年第4期总171期

农牧业信息化专题

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2019年1月28日

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▶ 前沿资讯

1 . Application of nanosized LiFePO₄ modified electrode to electrochemical sensor & biosensor (纳米级LiFePO₄修饰电极在电化学传感器和生物传感器中的应用)

简介: 电化学传感器和生物传感器使研究人员能够在实验环境中测量少量的化学物质或物理化学参数。这是通过使用敏感电极来实现的,它可以检测电信号的微小变化。由于这种敏感性,它们在工程和医学上具有多种应用。新版本的传感器在使用纳米材料的电极的帮助下具有更高的灵敏度和准确性。由海南师范大学化学与化工学院孙伟带领的研究团队对磷酸铁锂(LFP)修饰电极进行了生化分析或芦丁(一种柑橘类黄酮)和血红蛋白的测试。研究人员认为,LFP具有成本低、环境相容性好、安全性高、无毒、循环寿命长、环境富集等优点,是一种很有发展前途的新型修饰电极。Sun的团队使用扫描电子显微镜来分辨纳米级的LFP粒子。然后将颗粒溶液浇注在碳离子液体电极(CILE)表面,在修饰电极上滴加壳聚糖,制备LFP修饰电极,分别制备了芦丁和血红蛋白分析电极。研究团队利用这些纳米LFP电极研究了芦丁和血红蛋白的电化学活性,其中芦丁的检测限为8.0 nmol L⁻¹,血红蛋白三氯乙酸还原为0.068 mmol L⁻¹,过氧化氢还原为0.07 μmol L⁻¹。

来源: EurekAlert

发布日期: 2019-1-10

全文链接:

<http://agri.ckcest.cn/file1/M00/06/5B/Csgk0Fw4boeAR1zVAAIaFn5yhT0996.pdf>

2 . Ultra-sensitive sensor with gold nanoparticle array (金纳米颗粒阵列超灵敏传感器)

简介: Scientists from the University of Bath (UK) and Northwestern University (USA) have developed a new type of sensor platform using a gold nanoparticle array, which is 100 times more sensitive than current similar sensors. The sensor is made up of a series of gold disk-shaped nanoparticles on a glass slide. The team at Bath discovered that when they shone an infra-red laser at a precise arrangement of the particles, they started to emit unusual amounts of ultra violet (UV) light. This mechanism for generating UV light is affected by molecules binding to the surface of the nanoparticles, providing a means of sensing a very small amount of material. The researchers, from the University of Bath's Department of Physics, hope that in the future they can use the technology to develop new ultra-sensitive sensors for air pollution or for medical diagnostics. Dr Ventsislav Valev, Royal Society Research Fellow and Reader in Physics at the University of Bath, led the work with Research Associate David Hooper. He explained: "This new mechanism has great potential for detecting small molecules. It is 100 times more sensitive than current methods. "The gold nanoparticle disks are arranged on a glass slide in a very precise array - changing the thickness and separation of the disks completely changes the detected signal. "When molecules bind to the surface of a gold nanoparticle, they affect the electrons at the gold surface, causing them to change the amount of UV light they emit. "The amount of UV light emitted would depend on the type of molecules that bind to the surface. "This technique

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could enable ultra-sensitive detection of molecules in tiny volumes. It could in the future be used for detecting very low concentrations of biological markers for the early diagnostic screening for diseases, such as cancer." The study has demonstrated the proof of principle for this new sensing mechanism. The team would next like to test the sensing of various types of chemicals and expects the technique to be available to other scientists to use within five years.

来源: EurekaAlert

发布日期: 2019-01-09

全文链接:

<http://agri.ckcest.cn/file1/M00/06/5B/Csgk0Fw4bvuaFrcZAALG7EbZbVw855.pdf>

➤ 学术文献

1 . An electrochemical aptasensor based on gold@polypyrrole composites for detection of lead ions (一种基于金@聚吡咯复合材料的用于铅离子检测的电化学传感器)

简介: This work describes an electrochemical aptasensor for determination of lead ions (Pb²⁺). Composites prepared from gold nanoparticles and polypyrrole (Au@PPy) with good electrical conductivity were used to modify the surface of a screen printed carbon electrode for amplifying the current signal. Single strand DNA was immobilized on the electrode and binds lead(II) as confirmed by cyclic voltammetry at voltage of -0.2V similar to 0.6V. Differential pulse voltammetry, measured at 0.10V (vs. Ag/AgCl), was used to monitor the interaction between aptamer and lead(II) using hexacyanoferrate as an electrochemical probe. In the presence of Pb²⁺, the aptamer forms a G-quadruplex, and the peak current is increased. By this method, Pb²⁺ can be detected in the range of 0.5-10nM with a low detection limit of 0.36nM. The aptasensor was successfully applied to the determination of Pb²⁺ in polluted soil and baby's nail. The method showed outstanding sensitivity and selectivity in detecting Pb²⁺, therefore is considered to have great potential in developing an environmental monitoring platform.

来源: MICROCHIMICA ACTA

发布日期: 2018-11-13

全文链接:

http://agri.ckcest.cn/file1/M00/06/5B/Csgk0Fw4bXWAVehhAA_XbZukTY133.pdf

2 . Energy and economic analysis for the design of greenhouses with semi-transparent photovoltaic cladding (半透明光伏覆层大棚设计的能源与经济分析)

简介: Photovoltaic (PV) greenhouses generate solar electricity while providing a suitable environment for crop production. Energy and life cycle cost (LCC) analysis were employed to study the potential for installing semi-transparent photovoltaic (STPV) cladding on the roof of a greenhouse that employs supplemental lighting located in Ottawa, Ontario, Canada

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(45.4 degrees N). The study was conducted using current and future projected (future projection study) values for the efficiency of PV and horticultural lighting technology. The STPV cladding generated solar electricity but also caused internal shading that was counteracted by augmenting supplemental lighting by as much as 84%, which in turn reduced heating energy use by up to 12%. Although STPV cladding increased lighting electricity use, it generated 43.7% of the electricity that was consumed for supplemental lighting in the present study and 107.2% in the future projection study. Therefore, in the future, a STPV roof could potentially displace all the greenhouse's electricity needs for supplemental lighting. Currently, STPV cladding would not be an economically attractive investment. However, a nearly 23% reduction in LCC was achieved in the future projection study. STPV will increasingly become a promising cladding alternative for improving energy efficiency and economics of greenhouse operations.

来源: RENEWABLE ENERGY

发布日期: 2018-08-09

全文链接:

<http://agri.ckcest.cn/file1/M00/06/5B/Csgk0Fw4a7GANmrhAA6PNMPWPIw585.pdf>

➤ 相关专利

1. SOIL CHEMISTRY SENSOR (土壤化学传感器)

简介: We describe a soil chemistry sensor for in-situ soil chemistry sensing, the sensor comprising a probe incorporating a first, ion-selective electrode and a second, reference electrode, wherein said ion-selective electrode comprises a first-electrode housing defining a first lumen having an ion-selective plug towards a distal end, said first-electrode including a first conductor in a first electrolyte, wherein said reference electrode comprises a second electrode housing defining a second lumen having a porous reference electrode plug towards a distal end, said second electrode including a second conductor in a second electrolyte, wherein said ion-selective plug and said porous reference electrode plug are within 10 mm of one another, and wherein said porous reference electrode plug and said ion-selective plug each comprise a polymer.

来源: 欧洲专利局

发布日期: 2018-08-29

全文链接:

http://agri.ckcest.cn/file1/M00/06/5B/Csgk0Fw4beyAHz_tAAy6kw_EDRE724.pdf

➤ 统计数据

1. 2017年全国及各省生猪出栏量

简介: 布瑞克农产品数据库公布了2017年全国及各省份的生猪出栏量(单位: 万头), 具体见表中数据。

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地区 \ 年份	2017年
全国	70202.1
北京	242.068
天津	297.221
河北	3785.3
山西	822.795
内蒙古	918.964
辽宁	2627.2
吉林	1691.71
黑龙江	2090.45
上海	189.67
江苏	2805.5
浙江	1022.42
安徽	2828.9
福建	1606.1
江西	3180.46
山东	5180.69
河南	6220
湖北	4448.02
湖南	6116.3
广东	3712
广西	3355.06
海南	547.82
重庆	1751.11
四川	6579.1
贵州	1825.15
云南	3795.13
西藏	19.06
陕西	1141.01
甘肃	682.73
青海	110.63
宁夏	113.745
新疆	495.765

来源：布瑞克农产品数据库;; 中国畜牧业年鉴

发布日期:2018-11-06

全文链接:

<http://agri.ckcest.cn/file1/M00/06/5B/Csgk0Fw4b0qACj6ZAAHpXV9XJgI033.pdf>