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现代应用光学

用于阵列样品检测的扫描式表面等离子体共振生物传感器

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摘要: 针对阵列样品的定量检测, 构建了一种用于阵列样品检测的扫描式表面等离子体共振生物传感器。首先, 基于平面棱镜耦合下的最佳旋转轴位置和双棱镜探测光路搭建了阵列扫描式表面等离子体共振生物传感器。然后, 计算了可探测阵列样品的点密度。最后, 以蒸馏水和浓度分别为 5, 10, 15, 20, 25, 30, 35 mg/mL 的葡萄糖溶液作为待测阵列样品进行了多样品点的表面等离子体共振实验。实验测得阵列样品的共振角分别为 73.745, 73.919, 74.052, 74.185, 74.306, 74.408, 74.549, 74.660°, 显示葡萄糖溶液浓度与共振角线性关系良好, 证明了该方法和装置的可行性。该装置对提高阵列样品点密度, 实现高精度定量检测具有重要意义。

关键词: 表面等离子体共振 生物传感器 阵列扫描 样品密度

Scanning surface plasmon resonance biosensor for array sample detection

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Abstract: An scanning surface plasmon resonance biosensor was constructed to quantitatively detect array samples. First, based on the optimal rotation position in plane prism-coupling mode and a double-prism detection optical path, the scanning surface plasmon resonance biosensor for array samples was constructed. Then, the sample density of array samples was calculated. Finally, by taking the distilled water and glucose solution with different concentrations in 5, 10, 15, 20, 25, 30 and 35 mg/mL as array samples to be measured, the multi-sample spots were detected by surface plasmon resonance method. Experimental results show that the resonance angles of array samples are 73.745, 73.919, 74.052, 74.185, 74.306, 74.408, 74.549 and 74.660°, respectively, and the solution concentrations and their resonance angles show a good linear relation, which proves that the proposed method and device are feasibility. The device is significant for increasing the sample density of array samples and realizing the high precision detection.

Keywords: surface plasmon resonance biosensor array scanning sample density

收稿日期 2012-05-25 修回日期 2012-07-03 网络版发布日期

基金项目:

海洋赤潮灾害立体监测技术与应用国家海洋局重点实验室资助项目(No.MATHAB20120208); 暨南大学优秀本科推免生科研创新培育计划资助项目; 粤港关键领域重点突破招标资助项目(No.2005A20501001)

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