

[本期目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)[\[打印本页\]](#) [\[关闭\]](#)**论文****掺染料微结构光纤荧光传感器的理论分析**

李炳新, 邱慧

燕山大学 信息科学与技术学院, 河北 秦皇岛 066004

摘要:

针对一般光纤荧光传感器收集荧光能力不足的缺陷,设计了一种在微结构聚合物光纤的空气孔内填充掺有机染料高折射率液体的荧光传感器.使用可调节边界条件傅里叶分解法计算了这种微结构光纤的模场分布,分析了光纤结构参量和液体折射率对荧光捕获分数的影响,结果表明,使用小纤芯半径和高于纤芯折射率的液体可以增强激发光的吸收效率,增大荧光捕获分数,提高光纤荧光传感器的灵敏度.

关键词: 荧光传感器 荧光捕获分数 微结构光纤 功率分数

Theoretical Analysis of Dye-doped Microstructured Optical Fiber Fluorescence Sensor

LI Bing-xin, QIU Hui

School of Information Science and Engineering, Yanshan University, Qinhuangdao, Hebei 066004, China

Abstract:

Aiming at the insufficient capacity for the general optical fiber fluorescence sensors to collect the fluorescence, a novel fluorescence sensor filled with high index solution was designed that doped dyes in the air holes of microstructured optical fiber. Using the adjustable boundary condition fourier decomposition method, the mode field distribution of this microstructured fiber was given, and the fluorescence capture fraction was calculated under the influences of optical fiber structural parameters and the refractive index of solution. The results show that small core radius and higher refractive index of solution than that of core materials can enhance the absorption of the excitation light, and increase the fluorescence capture fraction and the sensitivity of these fluorescence sensors.

Keywords: Fluorescence sensor Microstructured optical fiber Fluorescence capture fraction Power fraction

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通讯作者:**作者简介:****参考文献:**

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