

Accepted Manuscript

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PII: S0925-4005(17)32170-6
DOI: <https://doi.org/10.1016/j.snb.2017.11.039>
Reference: SNB 23533

To appear in: *Sensors and Actuators B*

Received date: 8-5-2017
Revised date: 8-11-2017
Accepted date: 8-11-2017

Please cite this article as: Xiaohuan Huang, Peng Xia, Biyun Liu, Hua Huang, An azamacrocyclic functionalized GaAs (100) optical sensor for copper ion (II) detection in phosphate buffered saline solution, *Sensors and Actuators B: Chemical* <https://doi.org/10.1016/j.snb.2017.11.039>

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An azamacrocyclic functionalized GaAs (100) optical sensor for copper ion (II) detection in phosphate buffered saline solution

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Research Highlights

1. We fabricated a hybrid GaAs sensor for the label-free detection of copper ion.
2. Artificial organic azamacrocyclic cavities were anchored to the surface as receptors.
3. Cu^{2+} ions were selectively captured because the size of Cu^{2+} ions matched that of the artificial azamacrocycles.
4. The positive charges trapped by the cavities resulted in a PL decrease.
5. A significant Cu^{2+} -triggered wettability change was observed on Me2Cyclen functionalized GaAs.

Abstract

Copper ion is important in natural and biological processes. The present work describes the fabrication of a hybrid GaAs sensor for the label-free detection of copper ion in the near infrared region. The implemented sensing strategy relies on the

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