

Accepted Manuscript

Title: Ionic liquid modified N-doped graphene as a potential platform for the electrochemical discrimination of DNA sequences

Authors: Preethi Sukumaran, Thazhe Veettil Vineesh, Sivamathini Rajappa, Chen-Zhong Li, Subbiah Alwarappan



PII: S0925-4005(17)30496-3
DOI: <http://dx.doi.org/doi:10.1016/j.snb.2017.03.078>
Reference: SNB 21990

To appear in: *Sensors and Actuators B*

Received date: 22-10-2016
Revised date: 11-3-2017
Accepted date: 16-3-2017

Please cite this article as: Preethi Sukumaran, Thazhe Veettil Vineesh, Sivamathini Rajappa, Chen-Zhong Li, Subbiah Alwarappan, Ionic liquid modified N-doped graphene as a potential platform for the electrochemical discrimination of DNA sequences, *Sensors and Actuators B: Chemical* <http://dx.doi.org/10.1016/j.snb.2017.03.078>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Ionic liquid modified N-doped graphene as a potential platform for the electrochemical discrimination of DNA sequences

Preethi Sukumaran¹, Thazhe Veettil Vineesh¹, Sivamathini Rajappa¹, Chen-Zhong Li² and Subbiah Alwarappan^{1*}

¹Electrodics and Electrocatalysis Division, CSIR-Central Electrochemical Research Institute, Karaikudi – 630 003, Tamilnadu, India.

²Nanobiosensors / Bioelectronics Laboratory, Florida International University, Miami, FL 33174, USA.

*Corresponding Author: Dr. Subbiah Alwarappan, e.mail: salwarap@gmail.com (or) alwarappan@cecri.res.in

Highlights of the our short communication entitled “Ionic liquid modified N-doped graphene as an electrochemical platform for the selective discrimination of DNA sequences”

- A label free and selective platform for the discrimination of complementary and non-complementary DNA sequences was demonstrated
- Nitrogen doped graphene (NrGO) was synthesized by a catalyst free route.
- NrGO surface was modified using an Ionic liquid and employed for the DNA mutation analysis.
- The proposed platform holds a great promise to be employed for single nucleotide polymorphism detection.

ABSTRACT

Inventive designs for DNA-based electrochemical sensing are emerging tremendously in recent years. Herein, we report a label free ionic liquid (1-butyl-3-methylimidazolium tetrafluoroborate) modified nitrogen doped graphene electrode as a potential platform for the electrochemical discrimination of complementary and non-complementary DNA sequences. The proposed platform holds a great promise for the rapid and selective handheld detection of DNA sequences with a sensitivity and detection limit of 0.202 $\mu\text{A/nM/mm}^2$ and 8.12 nM respectively, without any expensive labeling and cross-hybridization artifacts.

Keywords:

Each keyword to start on a new line

Download English Version:

<https://daneshyari.com/en/article/5009407>

Download Persian Version:

<https://daneshyari.com/article/5009407>

[Daneshyari.com](https://daneshyari.com)