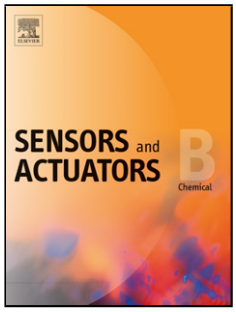

Title: Anionic iridium(III) complexes and their conjugated polymer soft salts for time-resolved luminescent detection of intracellular oxygen levels

Authors: Shujuan Liu, Liuwei Wei, Song Guo, Jiayang Jiang, Pinglin Zhang, Jianmei Han, Yun Ma, Qiang Zhao

PII: S0925-4005(18)30225-9
DOI: https://doi.org/10.1016/j.snb.2018.01.201
Reference: SNB 24050

To appear in: *Sensors and Actuators B*

Received date: 24-10-2017
Revised date: 20-1-2018
Accepted date: 25-1-2018

Please cite this article as: Shujuan Liu, Liuwei Wei, Song Guo, Jiayang Jiang, Pinglin Zhang, Jianmei Han, Yun Ma, Qiang Zhao, Anionic iridium(III) complexes and their conjugated polymer soft salts for time-resolved luminescent detection of intracellular oxygen levels, Sensors and Actuators B: Chemical https://doi.org/10.1016/j.snb.2018.01.201

Anionic iridium(III) complexes and their conjugated polymer soft salts for time-resolved luminescent detection of intracellular oxygen levels

Shujuan Liu, Liuwei Wei, Song Guo, Jiayang Jiang, Pinglin Zhang, Jianmei Han, Yun Ma , Qiang Zhao*

Key Laboratory for Organic Electronics and Information Displays and Institute of Advanced Materials (IAM), Jiangsu National Synergetic Innovation Center for Advanced Materials (SICAM), Nanjing University of Posts and Telecommunications (NJUPT), Nanjing 210023, P. R. China, Email: iamqzhao@njupt.edu.cn (Q. Zhao), Fax: (+86) 25-85866396.

*Corresponding author: iamqzhao@njupt.edu.cn.

Research Highlights

- A series of anionic iridium(III) complexes with different C^N ligands were designed and synthesized and their oxygen-sensing capability in solution and living cells were investigated.
- This is the first report about the application of anionic iridium(III) complexes and their conjugated polymer soft salts in biosensing and bioimaging fields.

Abstract

It is well known that hypoxia is a critical parameter with respect to several pathologies, like solid tumors. Hence, it is necessary to realize highly sensitive and selective monitoring of oxygen levels in biological systems. Phosphorescent iridium(III) complexes are an excellent class of oxygen probe through the energy transfer from triplet excitons to oxygen molecules. Current research mainly focuses on the neutral and cationic complexes, while the anionic ones received few attentions. Herein, we designed a series of anionic iridium(III) complexes with different C^N ligands and investigated their oxygen-sensing capability in solution and living cells. Importantly, based on the metathesis reactions of the anionic iridium(III) complexes with oxygen-insensitive cationic polyfluorene, water-soluble polymer soft salt P1 was synthesized successfully. Thus, ratiometric luminescent and reversible polymer hypoxia probe can be obtained because P1 can