

Improve the Abstract

English For Academic Purpose - Week3

Hu Jiyuan

September 26, 2018

1 Improvement

More and more attention is being paid on the harm of plastic pollutants for human and environment. Polystyrene (PS) and styrene are toxic compounds used in large quantities in the production of fiberglass reinforced polyesters. To address this problem, we provides a fast, accurate and sensitive method for independent monitoring PS biomarker PGA (phenylglyoxylic acid) in serum and urine, and the paper-based probe exhibit a new idea for design portable and easy to operate sensing devices combine with smartphone. We prepared Eu³⁺ functionalized Sc-based metalorganic frameworks as turn-on fluorescent switch for PGA, which has several appealing features including high sensitivity (LOD = 4.16 ppb), quick response time (less than 5 s) and broad linear range (0.02 mg/mL to 0.5 mg/mL). The Eu@MOFs with addition of PGA exhibits distinct enhanced luminescence and excellent selectivity that it is not affected by congeneric biomarkers. What's more, a paper-based fluorescence probe has been devised, which would perform an obvious fluorescence change from navy to red with the variety of PGA content. The practicability of the on-site detection platform for quantitative analysis using a colour scanning APP in smartphone has been also demonstrated by coupled with our proposed paper based fluorescence probe.

2 Origin

2.1 Abstract

The harm of plastic pollutants for human and environment is being paid more and more attention. Polystyrene (PS) and styrene are toxic compounds used in large quantities in the production of fiberglass reinforced polyesters. In this work, a simple method was designed for independent detecting polystyrene and styrene biomarker (phenylglyoxylic acid, PGA) in serum and urine. We prepared Eu³⁺ functionalized Sc-based metalorganic frameworks as turn-on fluorescent switch for PGA. The distinct enhanced luminescence is observed from the Eu@MOFs with addition of PGA. The fabricated fluorescent switch has several appealing features including high sensitivity (LOD = 4.16 ppb), quick response time (less than 5 s) and broad linear range (0.02 mg/mL to 0.5 mg/mL). Furthermore, Eu@MOFs exhibits excellent selectivity that it is not affected by congeneric biomarkers. More interestingly, a paper-based probe has been devised. The paper-based fluorescence probe would perform an obvious fluorescence change from navy to red with the variety of PGA content. The practicability of the on-site detection platform for quantitative analysis using a colour scanning APP in smartphone has been also demonstrated by coupled with our proposed paper based fluorescence probe. This work first provides a fast, accurate and sensitive method for independent monitoring PS biomarker PGA, and the paper-based probe exhibit a new idea for design portable and easy to operate sensing devices combine with smartphone.

2.2 Keywords

Turn-on fluorescence, Polystyrene biomarker, Serum and urine sensing, On-site detection.

2.3 Statistics

Origin: 11 sentences, 232 words.

Improvement: 7 sentences, 208 words

2.4 Source

Lian, Xiao, Tifang Miao, Xiaoyu Xu, Chi Zhang, and Bing Yan. "Eu3+ functionalized Sc-MOFs: Turn-on fluorescent switch for ppb-level biomarker of plastic pollutant polystyrene in serum and urine and on-site detection by smartphone." *Biosensors and Bioelectronics* 97 (2017): 299-304.
Url: <https://doi.org/10.1016/j.bios.2017.06.018>