

5th International Conference on **Wireless, Telecommunication & IoT**
&
11th Euro Biosensors & Bioelectronics Congress

October 23-24, 2019 Rome, Italy

Ultrasensitive optical biosensor for cardiac troponin I biomarker based on Mn-MOF

Sheta M Sheta¹, Said M El-Sheikh² and Mokhles M Abd-Elzaher¹

¹Inorganic Chemistry Department, National Research Centre, Egypt

²Central Metallurgical R & D Institute, Egypt

For the first time, a simple, fast technique, costless, room temperature, high accuracy, sensitivity and selectivity optical biosensor for cardiac troponin I (cTn) as an early test for myocardial infarction diagnosis could be addressed. It is also facilitated and helped an emergency departments (EDs) decision-making in patients with chest pain. A manganese metal-organic framework (Mn-MOF) synthesized via a simple method, and then fully characterized. A photoluminescence (PL) study based on Mn-MOF against cTn was investigated. The results showed that the Mn-MOF exhibited a strong emission at 422 nm with excitation at 300 nm at room temperature. Upon addition of cTn a redshift with remarkable quenching carried out and new emission band appeared at 397 nm. By applying the Stern-Volmer graph a linear correlation achieved over a concentration range 0.01-25 pg/mL of cTn with a correlation coefficient, 0.989, limit of detection and quantitation 0.01 pg/mL and 0.03 pg/mL, respectively. According to the significant quenching and redshift of the Mn-MOF PL intensities upon using different cTn concentrations was revealed. The Mn-MOF may be used successfully as optical biosensor for cTn in different biological samples (serum, plasma and whole blood). Moreover, the Mn-MOF showed a high selectivity towards cTn competing with other different interfering analytes. The quenching mechanism well studied and it has a dynamic type and obtained due to the energy transfer mechanism.

Biography

Sheta M Sheta is a Researcher at National Research Centre, Inorganic Chemistry Department, Giza, Egypt. He has obtained his BSc and Master's degrees in Applied Chemistry from Helwan University, Egypt in 2004 and 2010, respectively. He has obtained his PhD in Inorganic-Analytical Chemistry from Ain Shams University, Egypt in 2015. He joined the National Research Centre, Egypt in 2013. He is the Technical Manager in Family Medical Laboratory, Giza, Egypt since 2008. He serves as an Editorial Board Member and Reviewer of many reputed international journals. He has published 11 papers in reputed journals.

Notes: