

A promising optical approach for triiodothyronine hormone (T_3) based on smart polymeric Cu-MOF

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A copper metal-organic framework (Cu-MOF) was successfully synthesized via a facile method. The prepared Cu-MOF was characterized using many spectroscopic tools such as ¹H-NMR, FT-IR, UV-Vis, mass spectrometry, elemental analysis, FE-SEM/EDX and thermal analysis (DSC/TGA). The results indicated that the monomeric unit structure is $n[Cu(AIP)2(APY)(H_2O)_2].4H_2O$. The mass spectrum revealed that the molecular ion peak m/z at 647. SEM image, thermal analysis, the signals, and bands appeared in NMR and FTIR support the structure of nano-Cu-MOF. The photoluminescence (PL) studies were carried out with experimental variables like solvents and pH effect for the Cu-MOF. The prepared Cu-MOF was used (as a biosensor) in the determination of triiodothyronine hormone (T_3) in biological fluids. The PL spectra indicating that Cu-MOF has highly selective sensing properties for triiodothyronine hormone (T_3) without significantly interfering with different types of other human hormones. The significant quenching of the photoluminescence intensity of Cu-MOF in distilled water at λ_{em} 492 nm

by various concentrations of triiodothyronine hormone (T_3) was successfully used as an optical sensor for the determination of triiodothyronine hormone (T_3) concentration. The calibration plot was achieved over the concentration range 0.0-200.0 ng/dL triiodothyronine hormone (T_3) with a correlation coefficient 0.996 and limit of detection (LOD) and quantification (LOQ) 0.198 and 0.60 ng/dL, respectively.

Biography

Dr. Sheta is a Researcher in National Research Centre, Inorganic Chemistry Department, Giza, Egypt. He obtained his B.Sc. and Master's degrees in Applied Chemistry from Helwan University, Egypt in 2004 and 2010, respectively. He obtained his Ph.D. in Inorganic-Analytical Chemistry from Ain Shams University, Egypt in 2015, he joined the National Research Centre, Egypt in 2013. Technical Manager in Family Medical Laboratory, Giza, Egypt since 2008. He serves as an Editorial board member and reviewer of many international Journals.

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