Creatinine-imprinted polyacrylamide with fluorescent Nano diamond reporters

Reim Almotiri
Assistant Professor, King Abdulaziz University, Saudi Arabia

In this study, an artificial sensor based on the molecularly imprinted polymer (MIP) technique has been developed for detecting the creatinine application. In this technique, fluorescence from nano-diamonds (NDs) used as detection agent in two forms as spheres and thin films. A new washing method was developed in this work in order to increase the elimination of creatinine molecules from the MIP net system. The creatinine samples were fabricated in three different concentrations and rebound gradually to the binding sites inside the MIP as well as the non-imprinted hydrogel (NIP). The Results showed that NDs that are located next to the binding sites experienced fluorescence intensity reducing after rebinding process of creatinine to the MIP and NIP. The fluorescence quenching was comparative to the concentration of creatinine and it has higher values for MIP samples which could be attributed to an enhancement in the affinity for creatinine inside the MIP. The imprinting factor was found to be around 5.05 ± 2.15. Furthermore, the optical properties of NDs in both thin film and in solution was investigated using absorption, and transmission spectroscopies. The absorption results showed a minimum bandgap of 3.5 eV for NDs using Tauc plot method. Also, the transmission Results also showed about 90% transmittance of light in the visible range while it was zero transmittance at the UV range giving a promising ability for several applications such as sunscreen blockers.

Biography

Reim Almotir , is an Physics Doctoral graduate with experiences supporting multidisciplinary research field including bio integration, nano sensing, tissue engineering fields and organic solar cells. Reim's has her degree in 2020 and currently she is a faculty member at King Abdul-Aziz University at Jeddah, Saudi Arabia.