

## PRESENTATION ABSTRACTS

## SESSION 1A – NANOSENSOR &amp; NANOELECTRONICS I

**FLUORESCENCE SENSOR BASED ON CARBON QUANTUM DOTS FOR DETECTION OF BISPHENOL A**

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Industrial chemicals like epoxy glue, polycarbonate plastics, and other polymer-based products are frequently made using bisphenol A (BPA). It is present all throughout the world due to its broad use and heavy usage. Its high probability of human exposure and capacity to predisposition individuals even at extremely low concentrations attracted attention. In order to detect BPA in aqueous samples using fluorescence sensing. An innovative method in environmental sensing technologies was presented in this work by the production and characterization of 3-mercaptopropionic acid (MPA) doped carbon quantum dots (CQDs) from abundant organic waste of palm kernel fruit fibre (PKFF), via a straightforward, one-step hydrothermal synthesis technique. The successful incorporation of MPA into the CQDs structure exhibits an exceptional solubility and a dazzling blue fluorescence with an excitation/emission wavelength of 305 nm/360 nm. Which was further confirmed by an average particle size of 4.18 nm as seen in the HR-TEM pictures, and functional groups like -OH, -C=O, and -S are confirmed by FT-IR. Sharp peaks were seen in the XRD image of the crystallinity, with a good optical property revealed by the UV-Vis. The MPA-doped CQDs showed excellent selectivity and sensitivity for detecting BPA in aqueous solutions. Examining the fluorescence quenching process, shows a static quenching effect that was most likely caused by a contact between BPA molecules and the sulfur-containing functional groups on the CQDs-MPA. The sensor demonstrated exceptional a linear detection range for BPA doses of 1.0  $\mu\text{M}$  to 7.0  $\mu\text{M}$  with  $R^2 = 0.9863$  and a detection limit of 0.0056  $\mu\text{M}$ . The investigation's findings on actual samples—plastic plates and bottles—spiked with known concentrations of BPA also demonstrated that the system recovered between 107 and 114%. In essence, CQDs-MPA demonstrates the potential as a fluorescent probe for BPA detection and can serve as a useful tool for environmental monitoring, public health safety and use fulness in real-world situations.

**Keywords**— carbon quantum dots; bisphenol A; fluorescence; sensing; environment