

DESIGN AND SYNTHESIS OF MEROCYANINE-BENZOTHAZOLE CHROMOPHORE-BASED SENSOR FOR SELECTIVE TRINITROPHENOL (TNP) DETECTOR

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ABSTRACT

A novel (2E,4E)-2-(benzo[d]thiazol-2-yl)-4-(1,3,3-trimethylindolin-2-ylidene) but-2-enitrile (MC-BTH-1) chromophore was synthesized starting from 2-(benzo[d]thiazol-2-yl) acetonitrile and (Z)-2-(1,3,3-trimethylindolin-2-ylidene)acetaldehyde in the presence of catalytic amount of piperidine in EtOH. The synthesized chromophore structure was confirmed by FT-IR, ¹H NMR, ¹³C NMR, mass and HRMS spectral data. The MC-BTH-1 chromophore was used to investigate its sensing ability to selectively detect Trinitrophenol (TNP). The MC-BTH-1 conjugate displayed a remarkable sensing property towards Trinitrophenol (TNP) among tested nitro compounds *via* on-off fluorescence and UV-vis absorption mechanism with limit of detection 1.21×10^{-10} M, indicates the higher sensitivity towards Trinitrophenol (TNP).

Keywords: Trinitrophenol (TNP), Sensor, Benzothiazole, Fluorescence.