

## ABSTRACT

In this work, copper based metal organic frameworks has been synthesized by using 5-nitroisophthalic acid and sodium azide for studying turn on and turn off photoluminescence applications. FTIR analysis was used in which shifting of peaks depicts complex formation. Scanning electron microscope showed the crystals morphology. The rectangular block shaped crystals of Complex 24 observed by using this technique. For photoluminescence study, a series of nitroaromatics and heavy metals were used. Complex 51 and Complex 24 both are strong fluorescent sensors which revealed that increase in concentration of quenchers increases the quenching efficiency of MOFs but to a certain limit after that further addition does not cause a change in emission intensity. The quenching efficiency of quenchers has been calculated which is 80.9% for picric acid and 48% in case of 2-nitroaniline which has been selected for further study. Stern volmer graph which showed the  $K_{SV}=1.7 \times 10^3 M^{-1}$  and  $5.3 \times 10^3 M^{-1}$  for Complex 51 and Complex 24 which provide an idea about all the deactivation process and kinetics of reaction when an analyte interact with the fluorophore. The limit of detection 0.40 mmol for Complex 51 and 0.65mmol for Complex 24 while limit of quantification is 1.23mmol and 1.9mmol has also been calculated which exhibit the high sensitivity of Complex 51 and Complex 24 for fluorescent detection of nitro aromatics compounds. This study revealed that our MOF can not only be used for sensing application but for quantitative estimation of analytes also.