Metal Organic Materials for Detection of Azo Dyes: Sensing to Development of Prototype

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Our research is focused on development of new metal organic materials for diverse applications. At the beginning, we reported cadmium based co-ordination polymer as synthetic blood plasma anticoagulant [1]. We also reported a co-ordination polymer protein composite for anion sensing applications [2]. Further, keeping in view the significance of environmental protection from Industrial effluents, we designed and synthesized new metal organic materials *viz.* co-ordination polymer [3] and metal organic gel [4] for detection of azo dyes. During the textile process, inefficiency in the coloring generates large amounts of dyes residues which are directly released into water bodies consequently contaminating the environment. Among the various residues of dyes that pollute environment important ones are azo dyes. The azo dyes are highly toxic, carcinogenic and genotoxic because of their high Chemical Oxygen Demand (COD) values. Some of these industrial azo dyes are BY (Brilliant yellow), AYGG (Alizarin yellow GG), MO1(Mordant orange 1), TONa (Tropaeolin O sodium salt), MO (Methyl orange), PAP (4-Phenylazophenol), SII (Sudan II), OG (Orange G) and AB (Azobenzene). Therefore, detection of these dye molecules is highly significant

We did not limit the scope of our work to sensing and went beyond the boundaries to develop a nanoparticulate assembly for degradation of 'brilliant yellow' azo dye [5]. Further, taking informal industrial inputs and with involvement from faculties of other disciplines, we are in process of development of a prototype to demonstrate the utilization of our synthesized systems at Industrial scale in real world. The overview of above mentioned work will be discussed in the conference.

References:

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5. Journal of Nanoparticle Research, 18, 2016, 381.