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Debasish Das, Ashim Maity, Milan Shyamal, Samir Maity, Naren Mudi, Ajay Misra



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Aggregation Induced Emission of 9-Anthraldehyde Microstructures and Its Selective Sensing Behavior towards Picric Acid

Debasish Das, Ashim Maity, Milan Shyamal, Samir Maity, Naren Mudi and Ajay Misra

^aDepartment of Chemistry and Chemical Technology, Vidyasagar University, Midnapore
721102, W.B, India

Abstract

A novel material showing aggregation induced emission (AIE) is developed by reprecipitation method using 9-Anthraldehyde (9-AC), where Sodium dodecyl sulfate (SDS) was used as morphology directing agent. 1-dimension rod and 2-dimension elongated hexagon shaped morphology of 9-AC aggregates have been synthesized. Morphology of the materials was characterized using optical microscopy. Photophysical properties of the hydrosol were studied using UV-Vis, steady state and time resolved fluorescence emission techniques. Computation of second order Fukui parameter as local reactivity descriptor on each atomic center of the titled compound also substantiate that the neighboring 9-AC molecules are arranged in trans conformation in its aggregated structures and this is in conformity with the crystal structure of 9-AC. The 'turn off' fluorescence property of aggregated 9-AC has been utilized for selective detection of picric acid and the fluorescence quenching has been explained due to ground state complexation between 9-AC and picric acid. The observed detection limit of picric acid was found as low as 8.07 μ M.

Keywords: 9-Anthraldehyde, Aggregates, Morphology, aggregation induced emission (AIE), Fukui parameter, DFT.

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