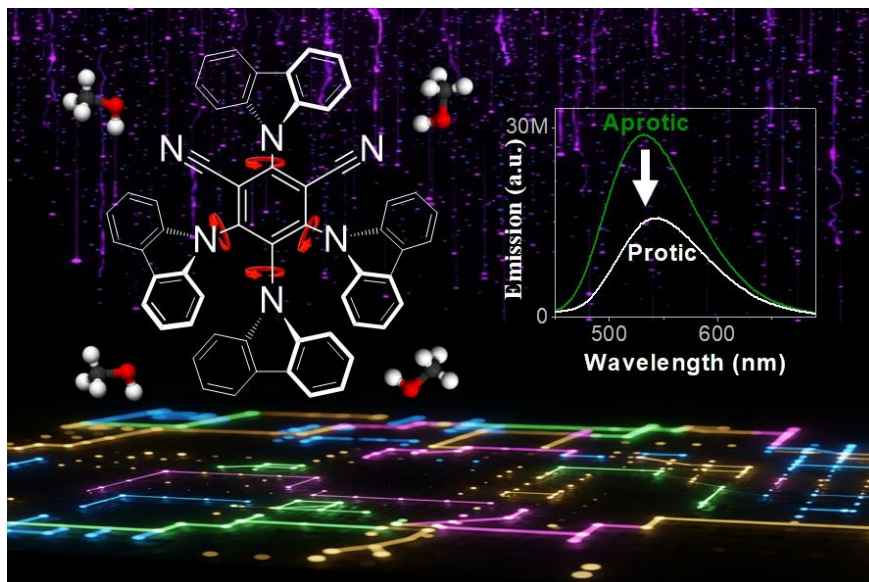


Hydrogen-Bonding Environment Suppresses Thermally Activated Delayed Fluorescence

By

Dr. Palas Roy and Co-workers, Department of Chemistry, SBS, IIT BBS



State-of-the-art OLED (Organic Light-Emitting Diode) technologies utilise thermally activated delayed fluorescence (TADF) materials, but the role of their surrounding environment is not well understood.

We found that hydrogen-bonding environments—especially protic solvents—strongly reduce TADF brightness. Using isotope experiments, we showed that solvent protons directly interact with the photoexcited molecule, forcing it into shapes that emit light poorly and lowering overall efficiency. This highlights that carefully controlling the emitter’s microscopic environment is crucial for building more efficient next-generation displays.

Reference: S. S. Puhan, L. Dash and P. Roy*, “Hydrogen-Bonding Environment Suppresses Thermally Activated Delayed Fluorescence” *Chem. Sci.* (2025 *Just Accepted*) DOI: 10.1039/D5SC05548B