FLUORESCENCE DYNAMICS OF EXCITED STATE PROTON TRANSFER IN SALICYLIC ACID: REVISITED

HIRDYESH MISHRA, *Department of Physics, Banaras Hindu University, Varanasi, Uttar Pradesh, India.*

Excited state intramolecular proton transfer (ESIPT) reaction in salicylic acid (SA) and its derivatives has been the subject of intense investigations. Due to its importance in photo-chemical and photo-biological reactions, ESPT reaction has been reviewed by many workers in number of molecular systems. These compounds are promising in the development of proton transfer lasers, photostabilisers and information storage devices at the molecular level. Like other carboxylic acids, SA also exists as a cyclic hydrogen bonded dimmer in the solid state, in non-polar solvents and in the gas phase at high concentrations. SA dimer is the smallest aromatic system in which both intra and inter molecular hydrogen bonding exist and thus constitute an ideal model to study both inter and intra molecular proton transfer in a single system. This system is found to be complicated due to the presence of two acidic protons, one on the carboxylic group and other on the phenolic group in each monomeric unit in dimmer, which are partially exchanged. The emission spectra of two rotamers and their dimers unfortunately overlap. As a results, there is no reliable studies on the excited electronic states of SA in the condensed phase. SA shows dual emission (UV and blue) in the non-polar as well as in the crystalline state. In the present work, photo physics and photochemistry of SA in crystalline (solid) state have been reinvestigated by both experimental and computational spectroscopic computational calculations technique.