

## Supplemental Supporting Information for

### The Origin of Water-Induced Fluorescence Turn-On from a Schiff Base Compound: AIE or H-Bonding Promoted ESIPT?

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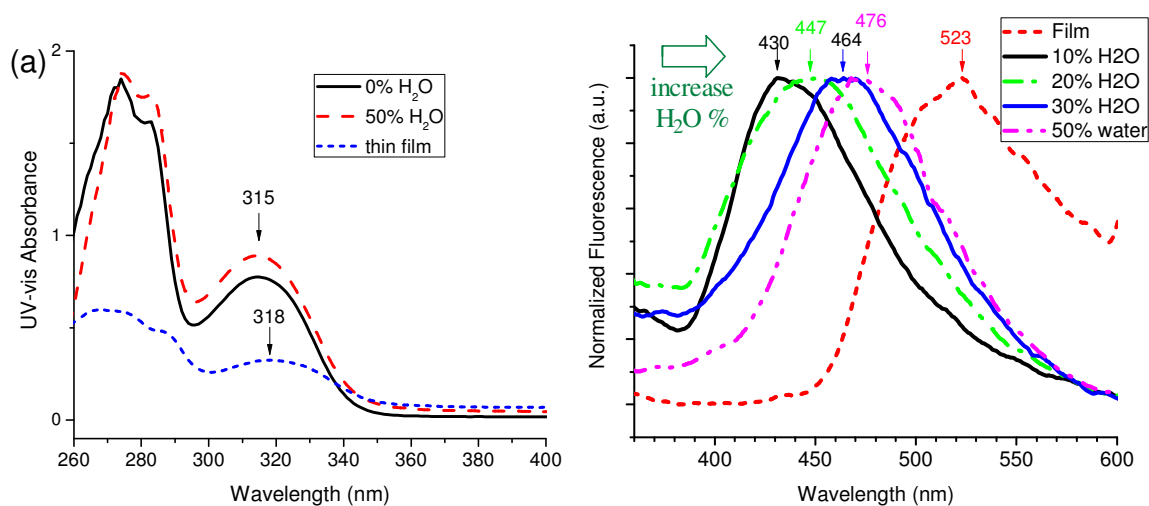


Figure S1. UV-vis (a) and normalized fluorescence (b) of **4** in film state and in acetonitrile with different content of water. The film was prepared by spin-casting the solution on a quartz plate at room temperature.

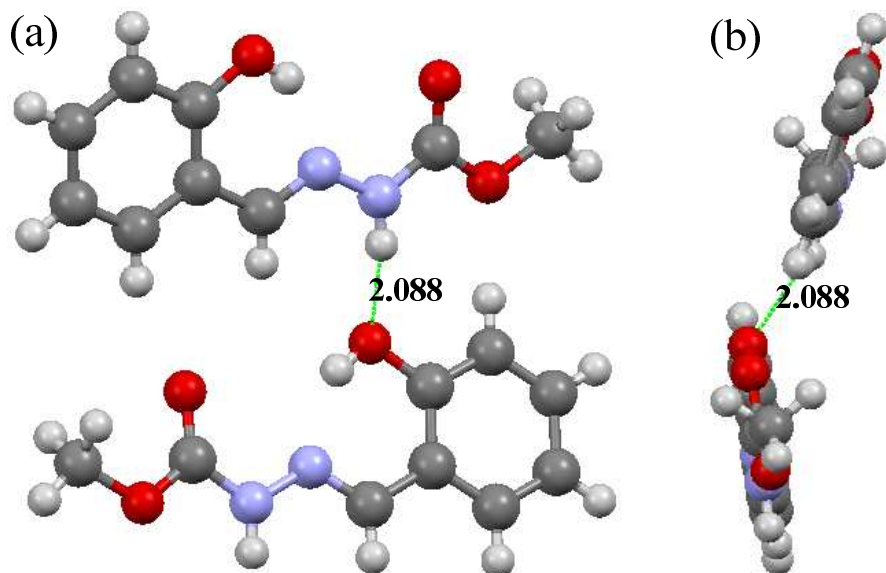


Figure S2. Crystal packing of **4** in front (a) and side view (b). The distance for hydrogen bond N—H...O is 2.088 Å. Crystal structure of **4** suggests the possible intermolecular interaction, in which adjacent molecules were oriented in an antiparallel fashion and connected via a hydrogen bond N—H...O. Such interaction, however, does not show strong  $\pi$ - $\pi$  interaction between the aromatic planes, which is important for the aggregate formation.

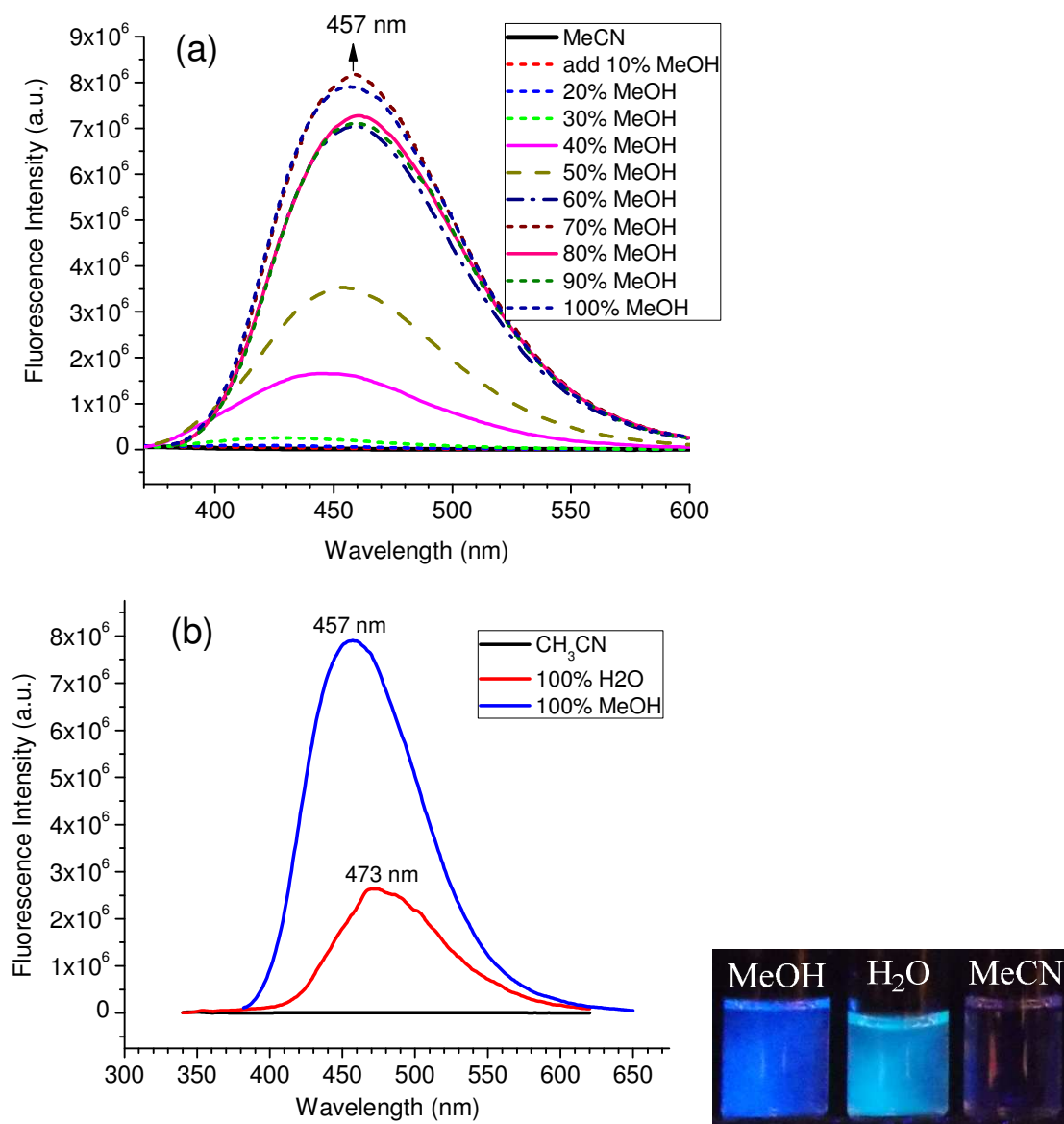


Figure S3. Fluorescence of **4** (10  $\mu\text{M}$  concentration) in dry acetonitrile or  $\text{CH}_3\text{CN}/\text{MeOH}$  in different ratios (a). And comparison of fluorescence turn-on in different polar solvents (water or MeOH in 10  $\mu\text{M}$  concentration) (b). Excitation at 320 nm. The fluorescence images on the right were from the solution of **4** (10  $\mu\text{M}$ ) in different solvents under UV-irradiation.

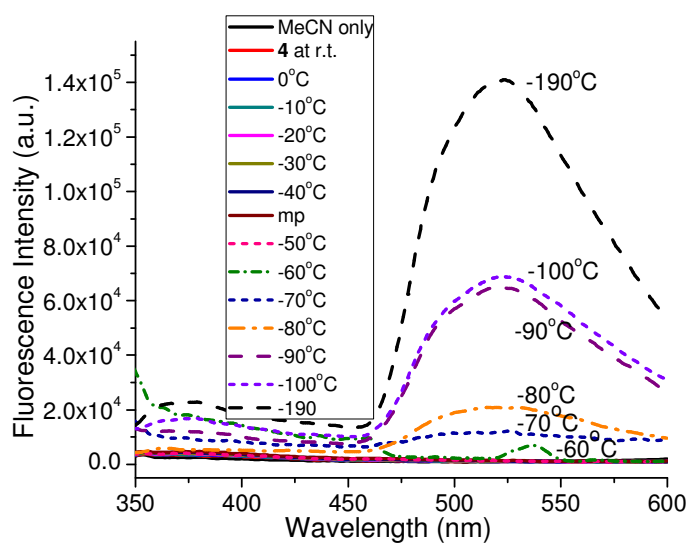


Figure S4. Fluorescence spectra of **4** in CH<sub>3</sub>CN at different temperatures.

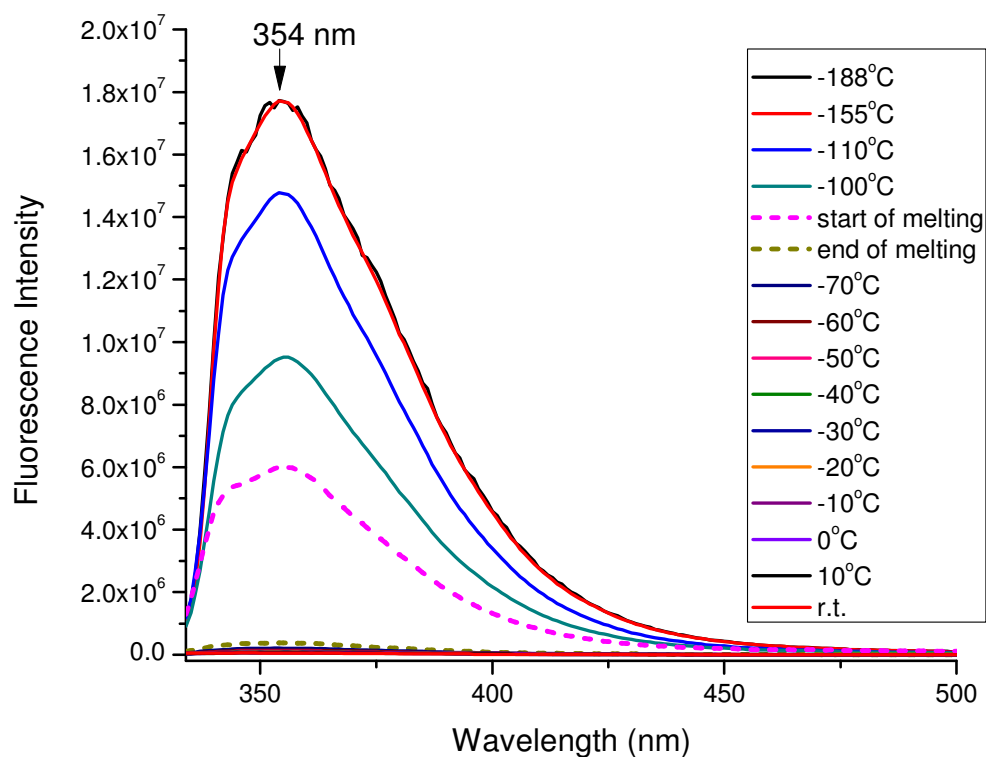


Figure S5. Fluorescence spectra of **5** in MeOH at various temperatures. The broken lines indicate that the spectrum was acquired when the frozen matrix started to melt or just completed the melting.

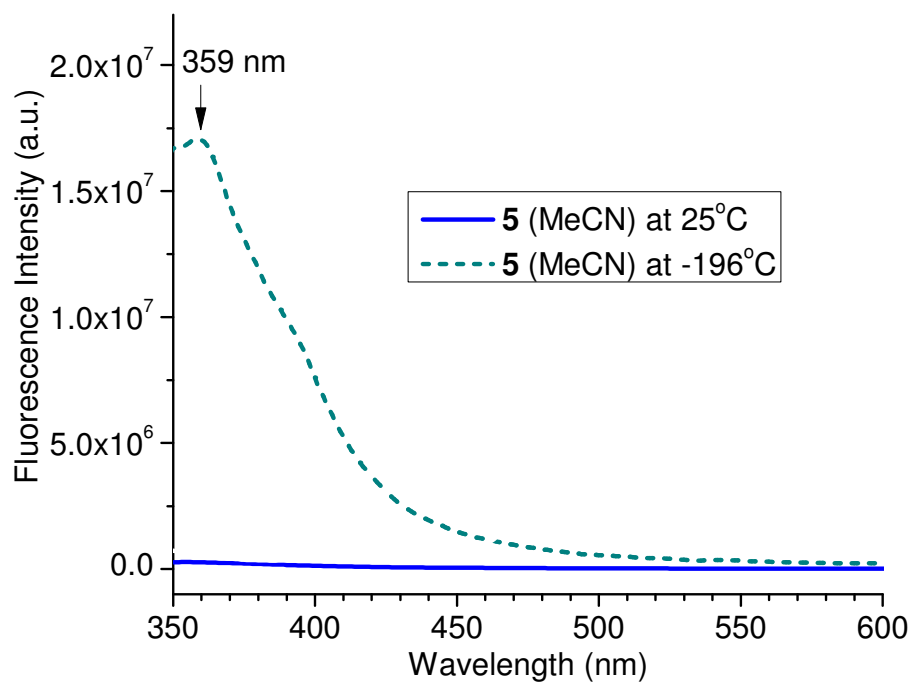
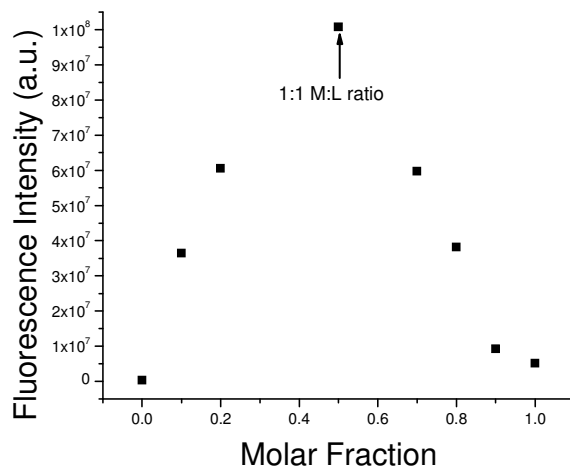


Figure S6. Fluorescence of **5** in MeCN (concentration 10  $\mu$ M) at room and low temperature.



**Figure S7:** Job plot for **4**. The observed peak intensity was at 0.5 (1:1 ratio for **4**:Al<sup>3+</sup>) indicating that there is a strong binding affinity to aluminum.

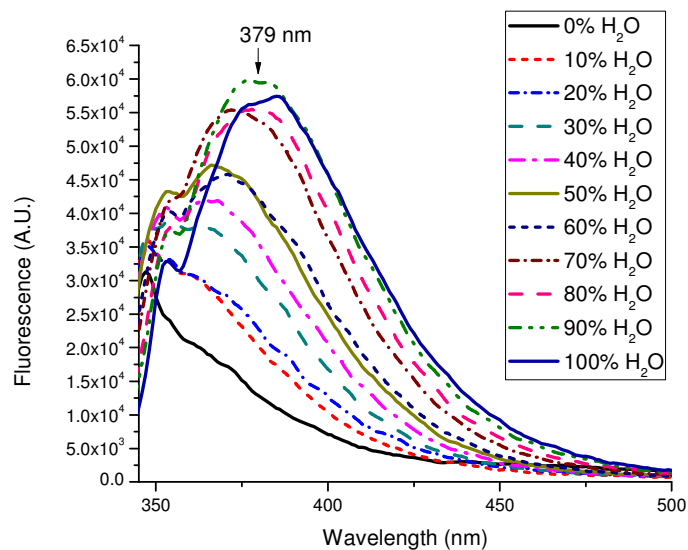


Figure S8. Fluorescence of **5** (10  $\mu\text{M}$  concentration) in dry acetonitrile or  $\text{CH}_3\text{CN}/\text{H}_2\text{O}$  in different ratios.

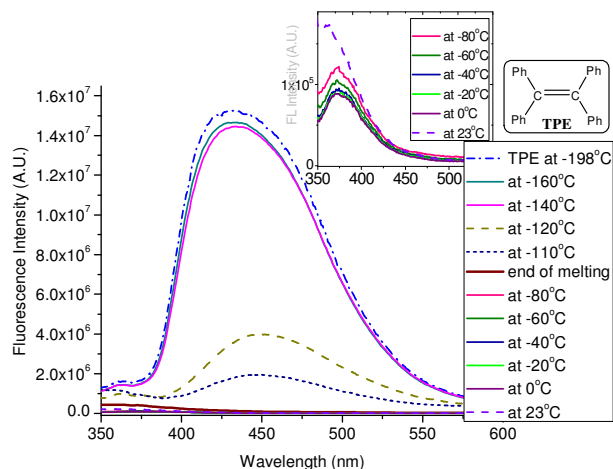


Figure S9. Fluorescence of **TPE** (concentration 10  $\mu\text{M}$ ) in THF at room and low temperatures. Excitation at 308 nm. The top inset shows a negligible fluorescence intensity change at 450 nm in the temperature range from 23°C to  $-80^\circ\text{C}$ . The emission exhibits large turn-on at the very low temperature, as the TPE is frozen in solvent matrix (below  $-110^\circ\text{C}$ ).