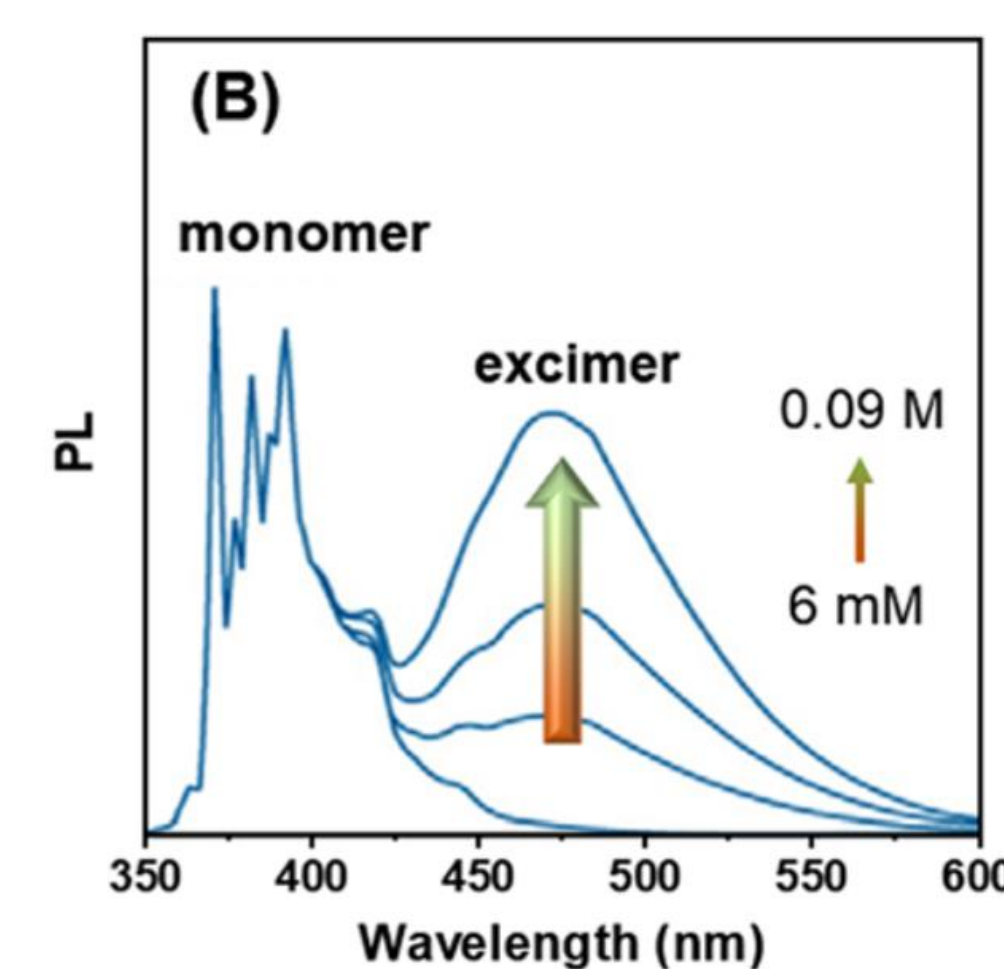


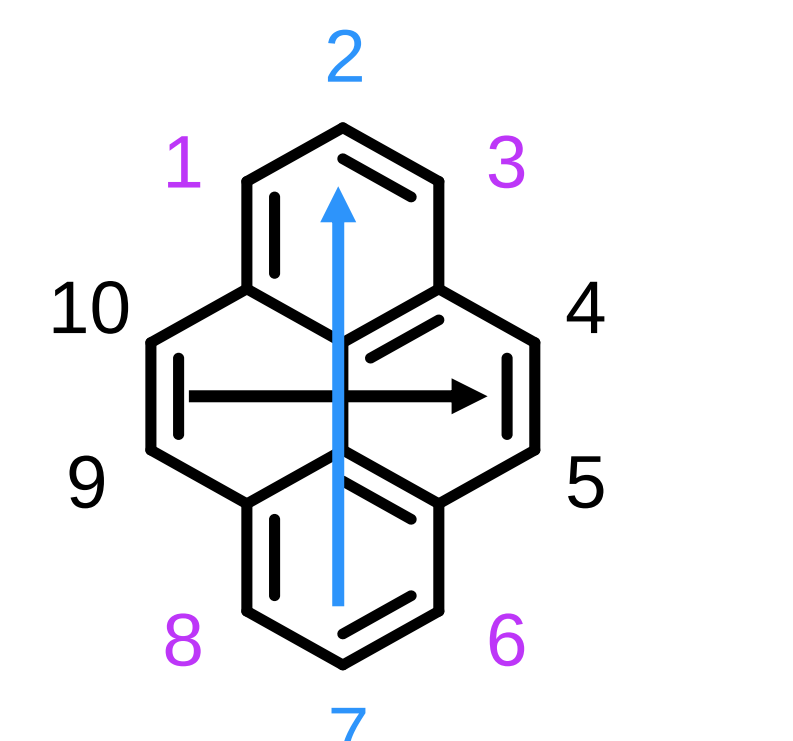
Introduction

- Excimer formation** is a process that chromophoric molecules may undergo when in proximity to one another
- This **lowers the available energy** for useful processes
- Understanding and controlling this is an essential step in the development of the next generation of dye-sensitized solar cells, OLEDs, photoredox catalysts, and more



Manandhar, et al. *Mater. Chem. Front.*, 2008, **3**, 762.

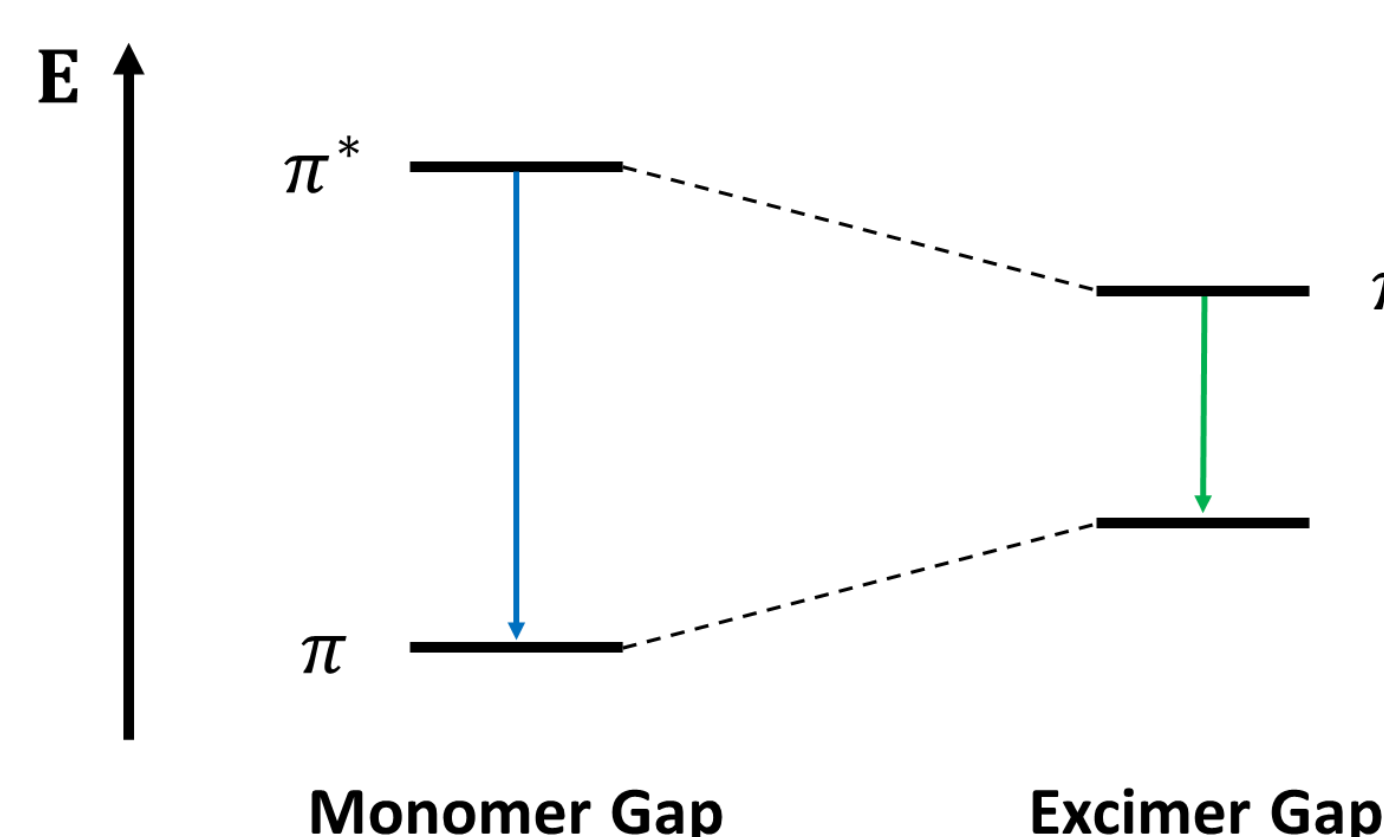
Pyrene is a ubiquitous chromophore with studied excimer properties



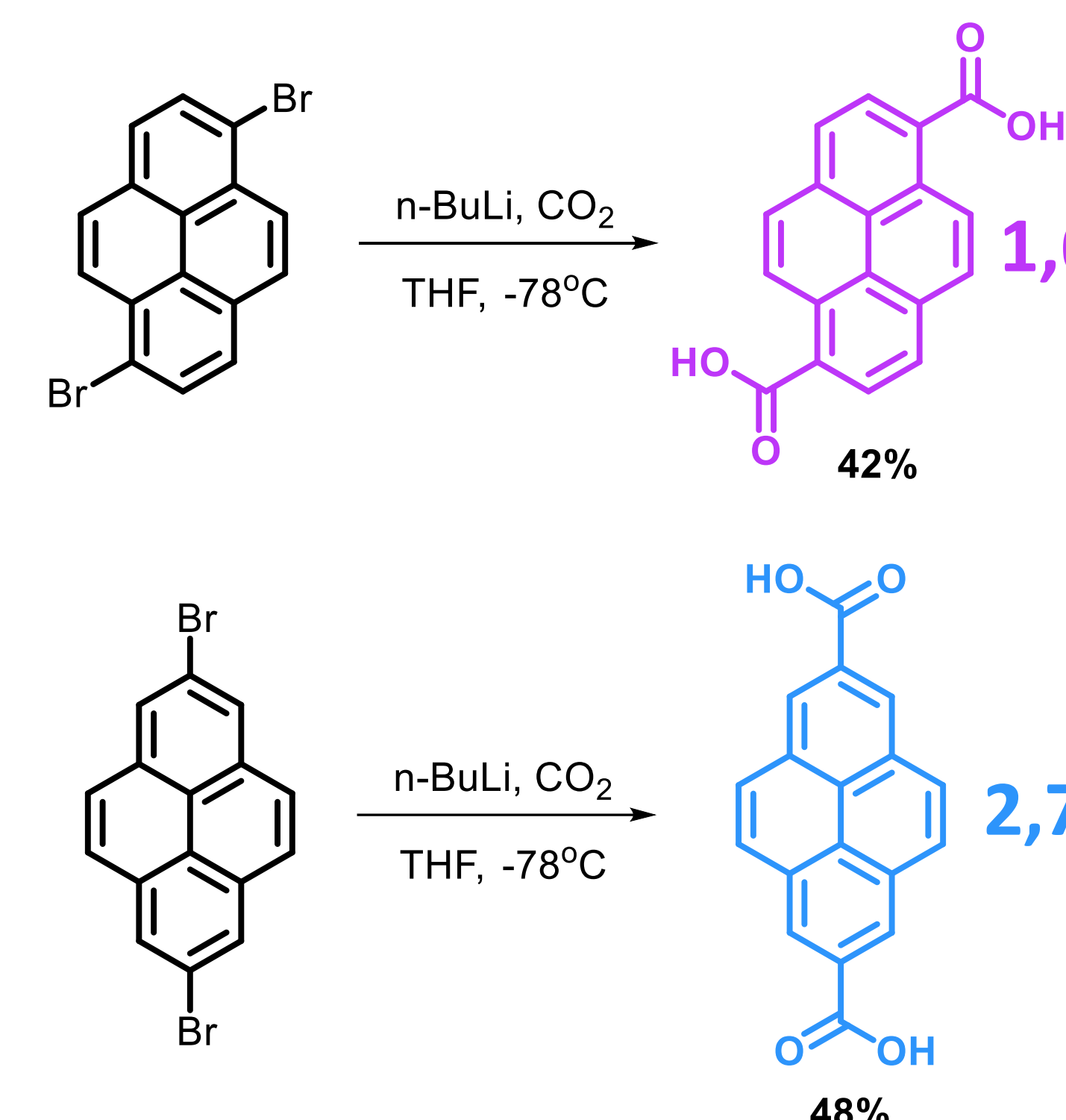
1, 3, 6, 8-positions
2, 7-positions
4, 5, 9, 10-positions

Active sites
Planar node
K-region

Feng, et al. *Chem. Soc. Rev.*, 2023, **52**, 6715.

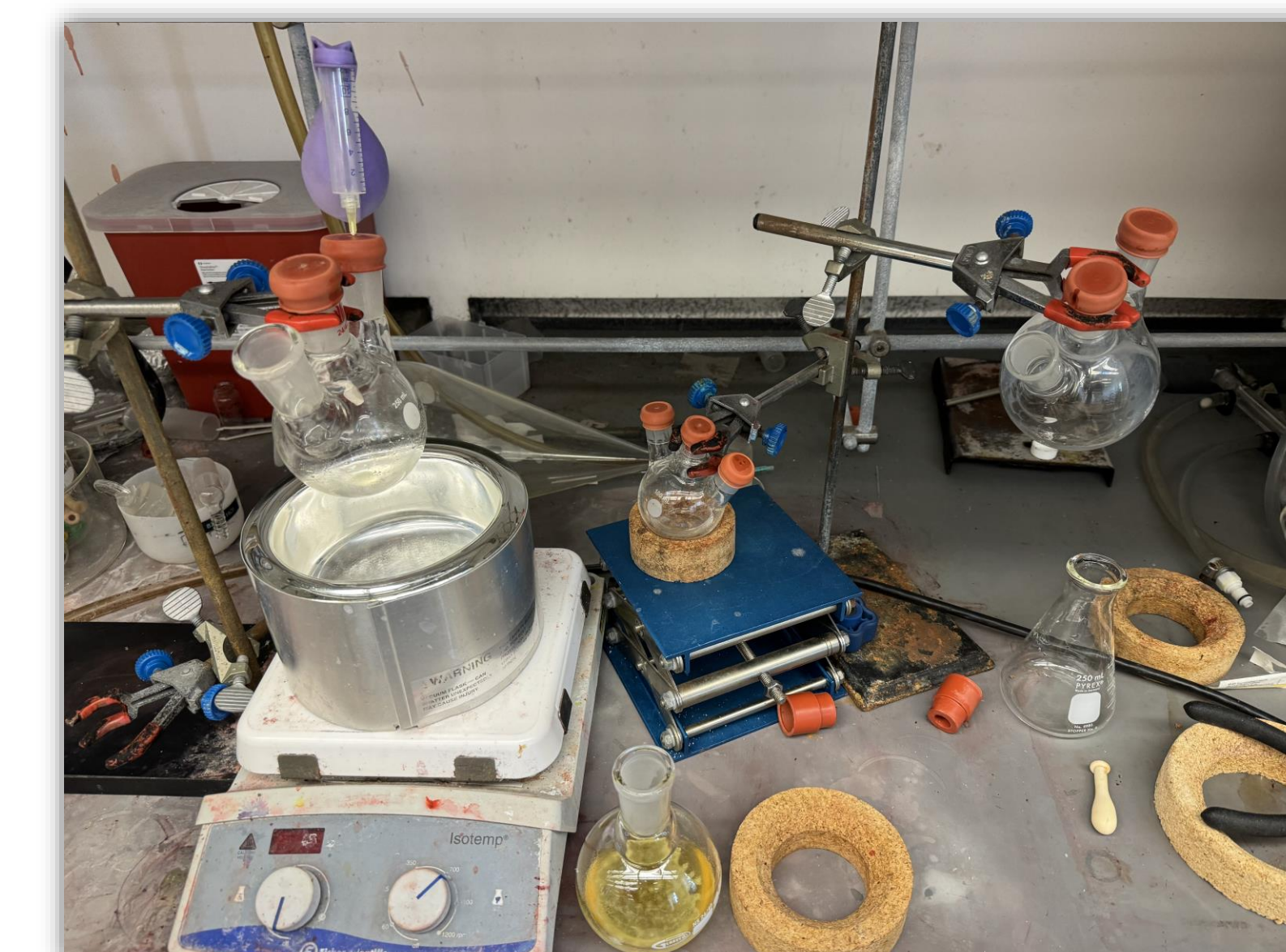


Carried out through **carboxylation** of dibromo pyrenes, substituted at the **1,6** and **2,7** positions, respectively



Zou, et al. *Chem. Commun.*, 2015, **51**, 12585.
Dang, et al. *Langmuir*, 2007, **23**, 11980-11985.

Synthesis

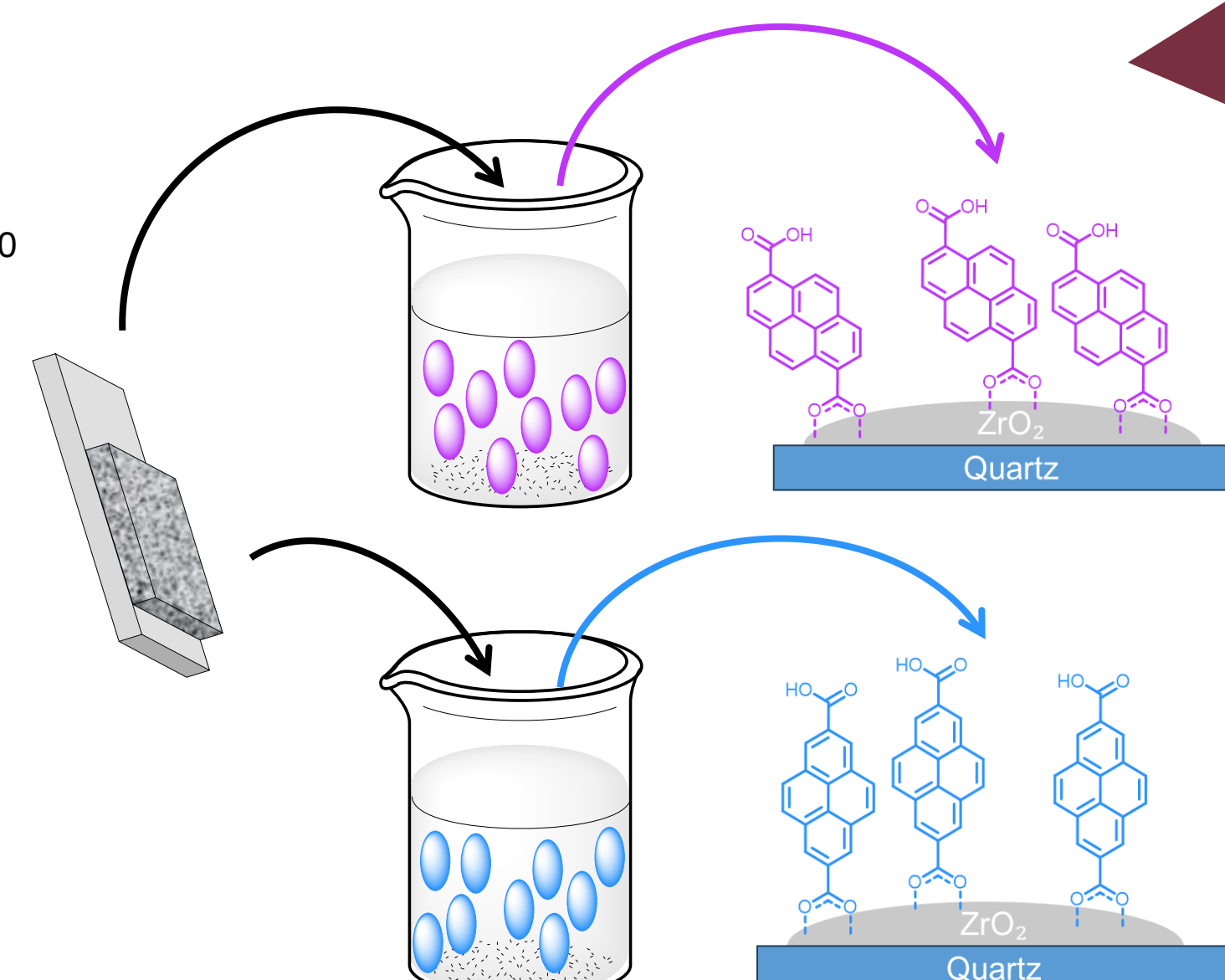
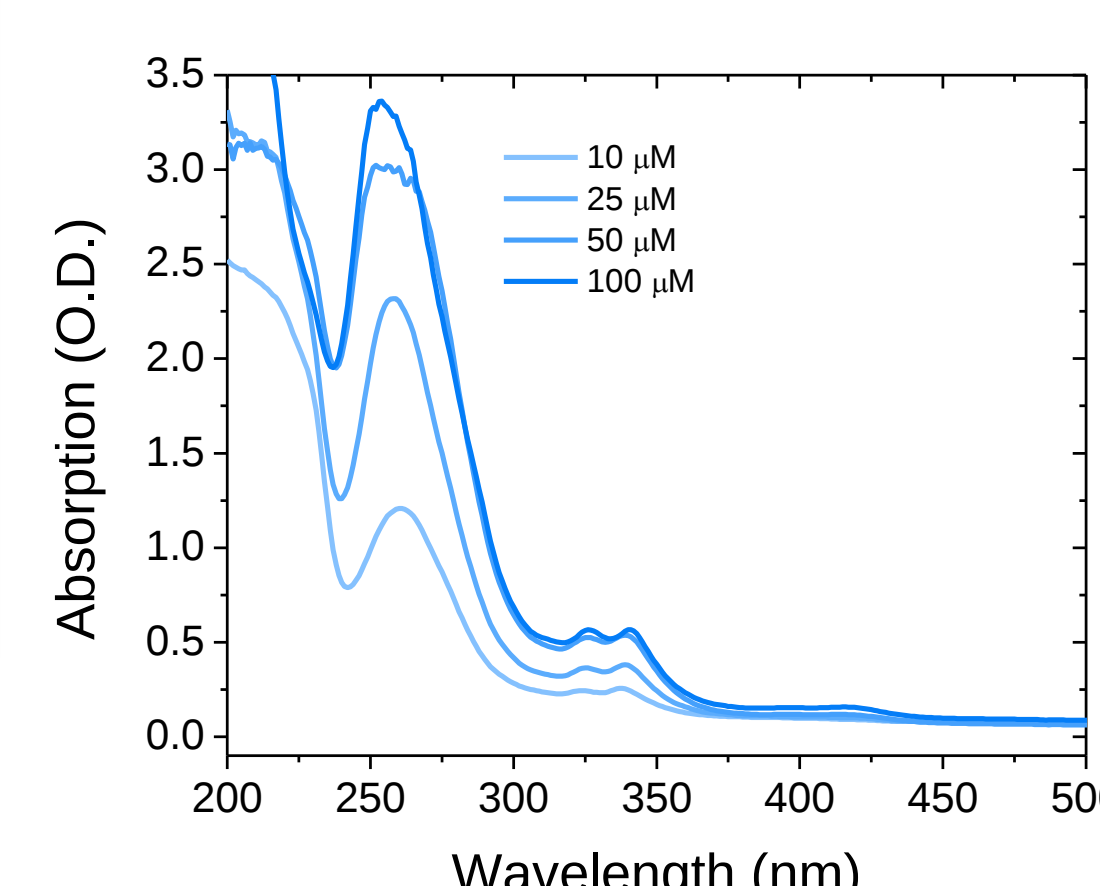
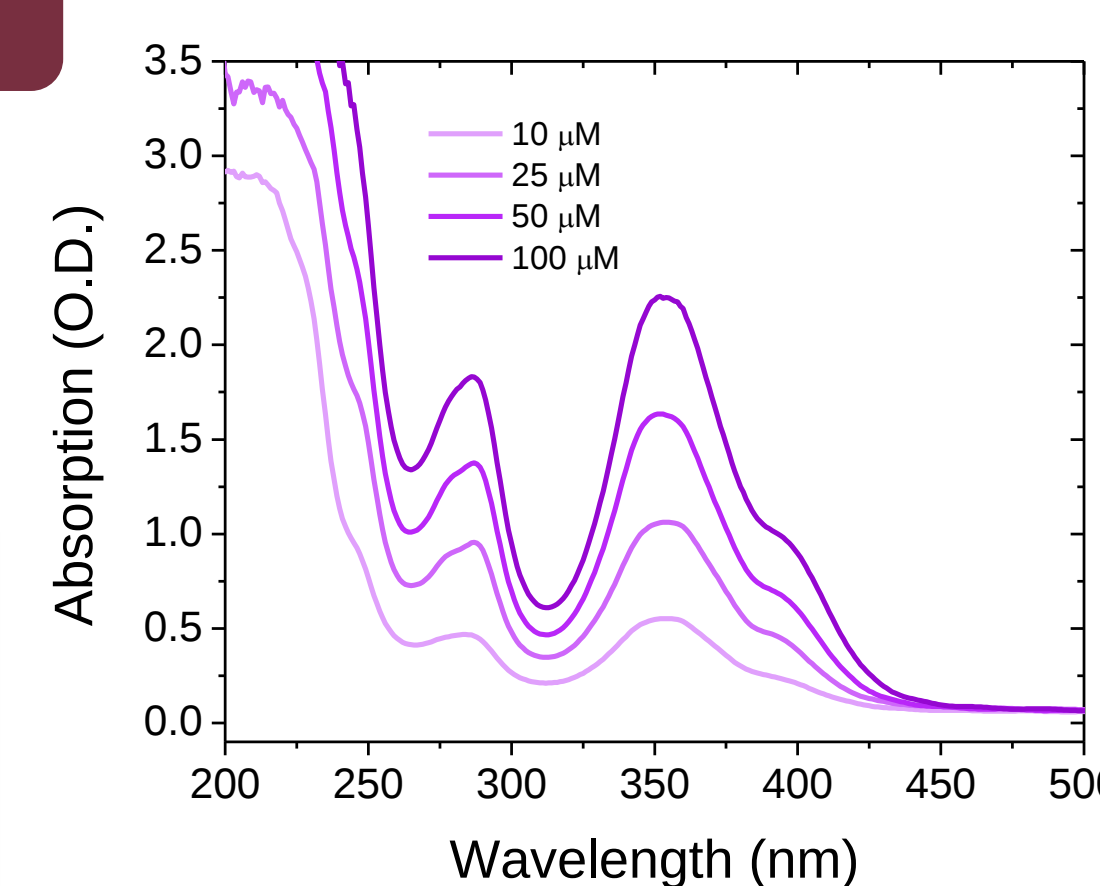
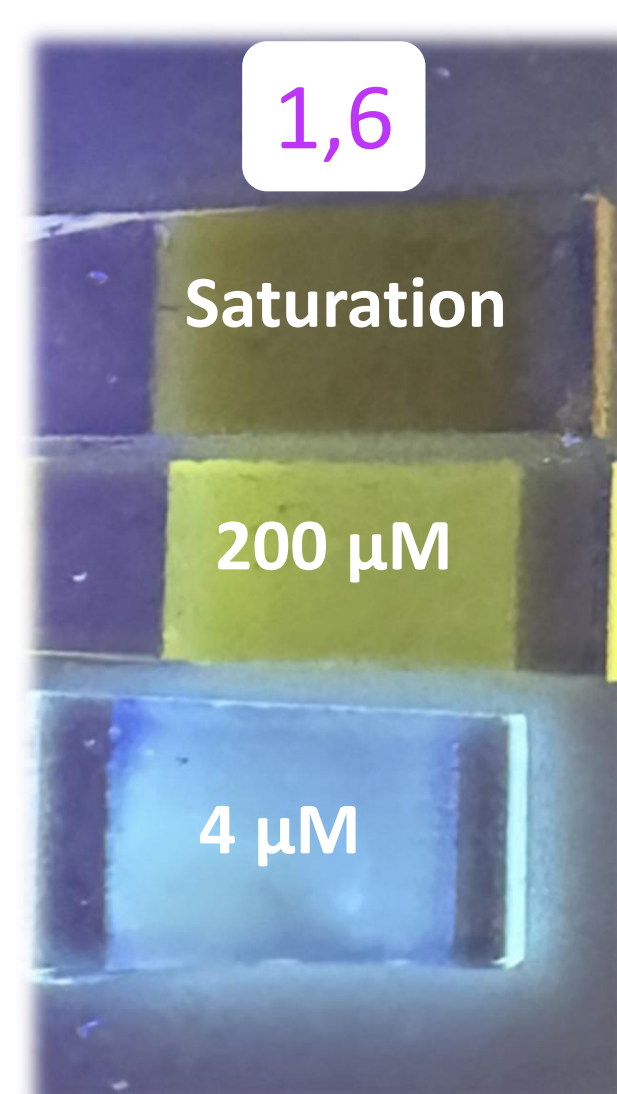


Acknowledgements

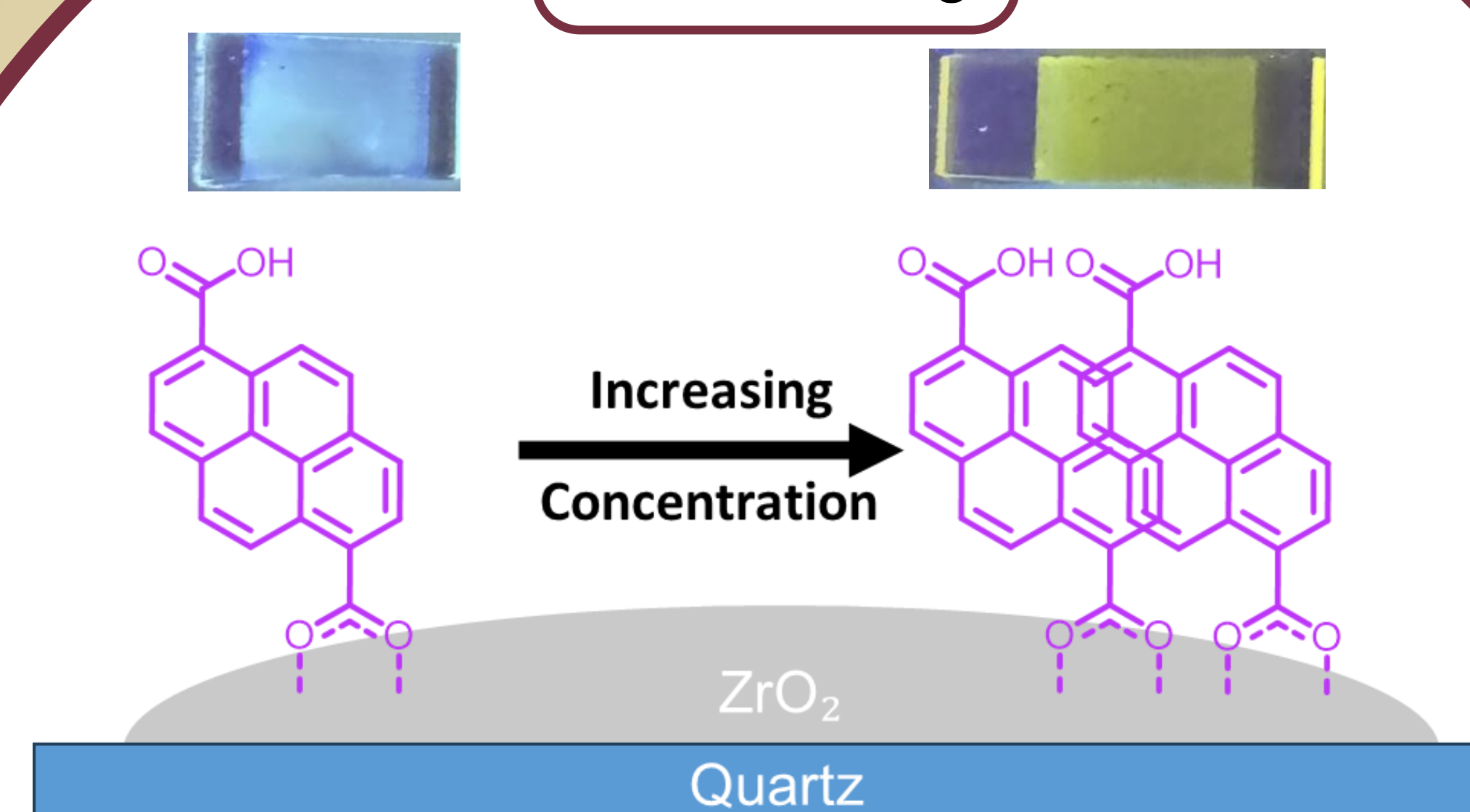


Surface Loading

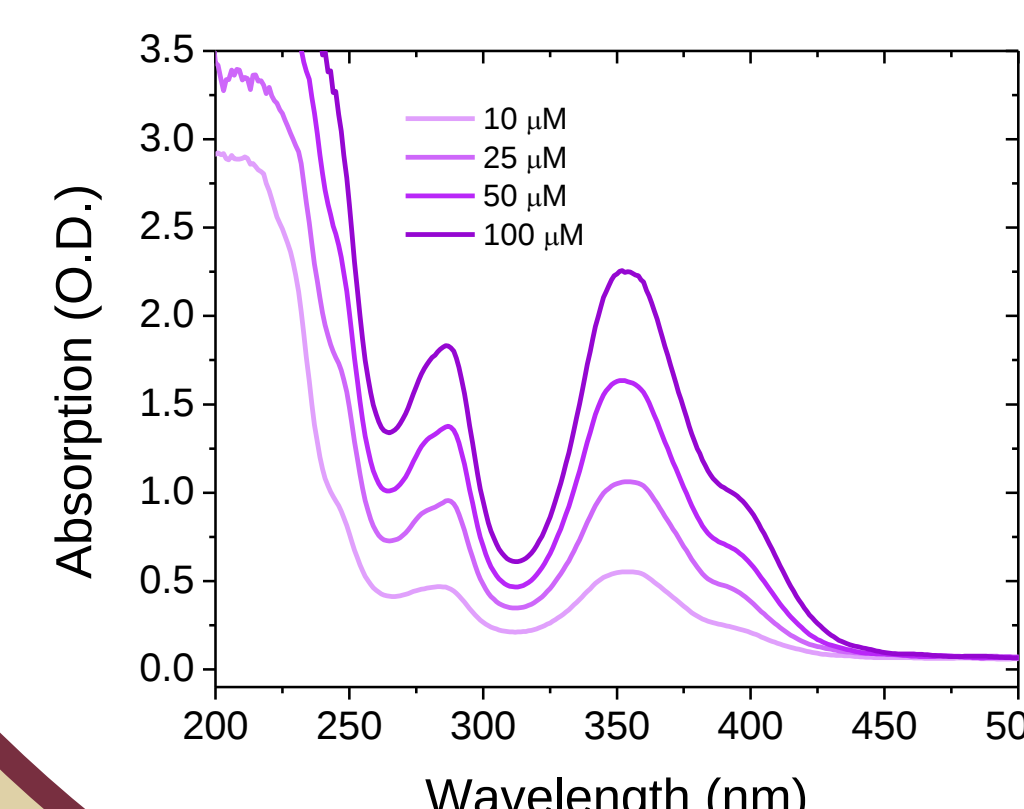
- Preliminary results for **1,6** show evidence of a spectral **red shift** in the emission and a **decrease in photoluminescence** with increasing concentration, a trait not shared by **2,7**
- Current work, including **fsTA** and **surface emission**, will confirm this



Excimer emission at high surface loading

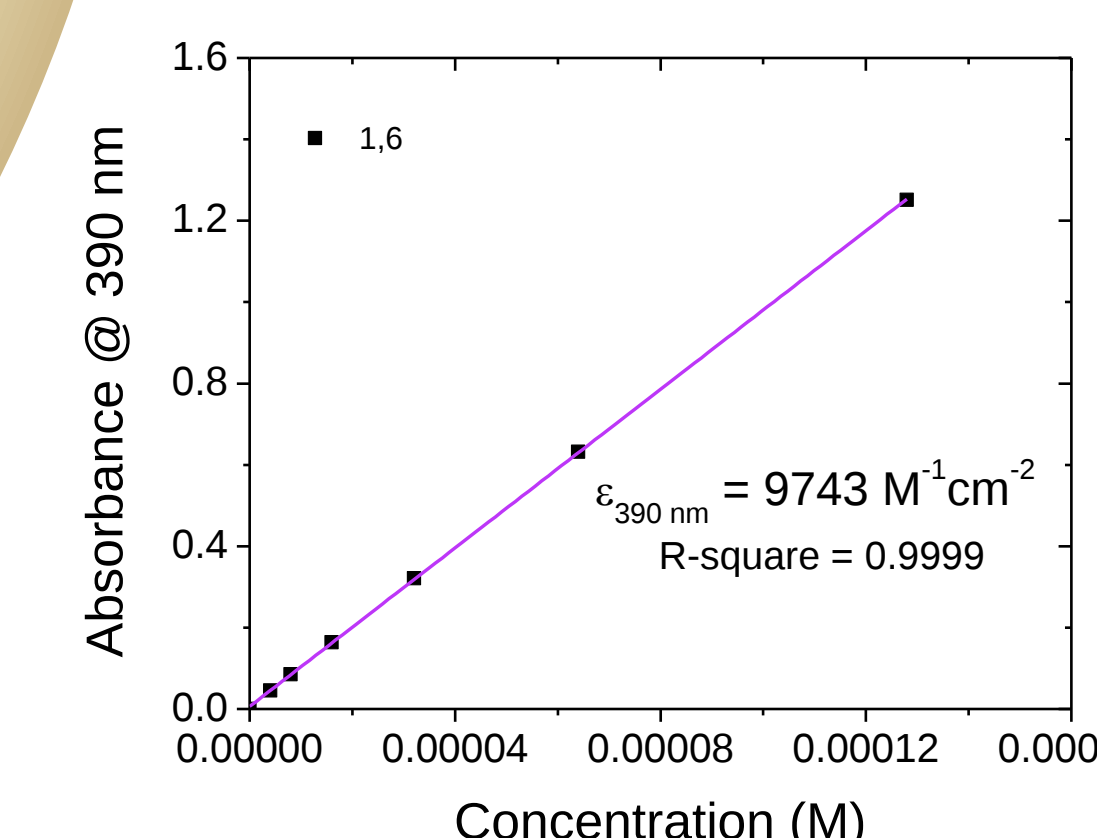
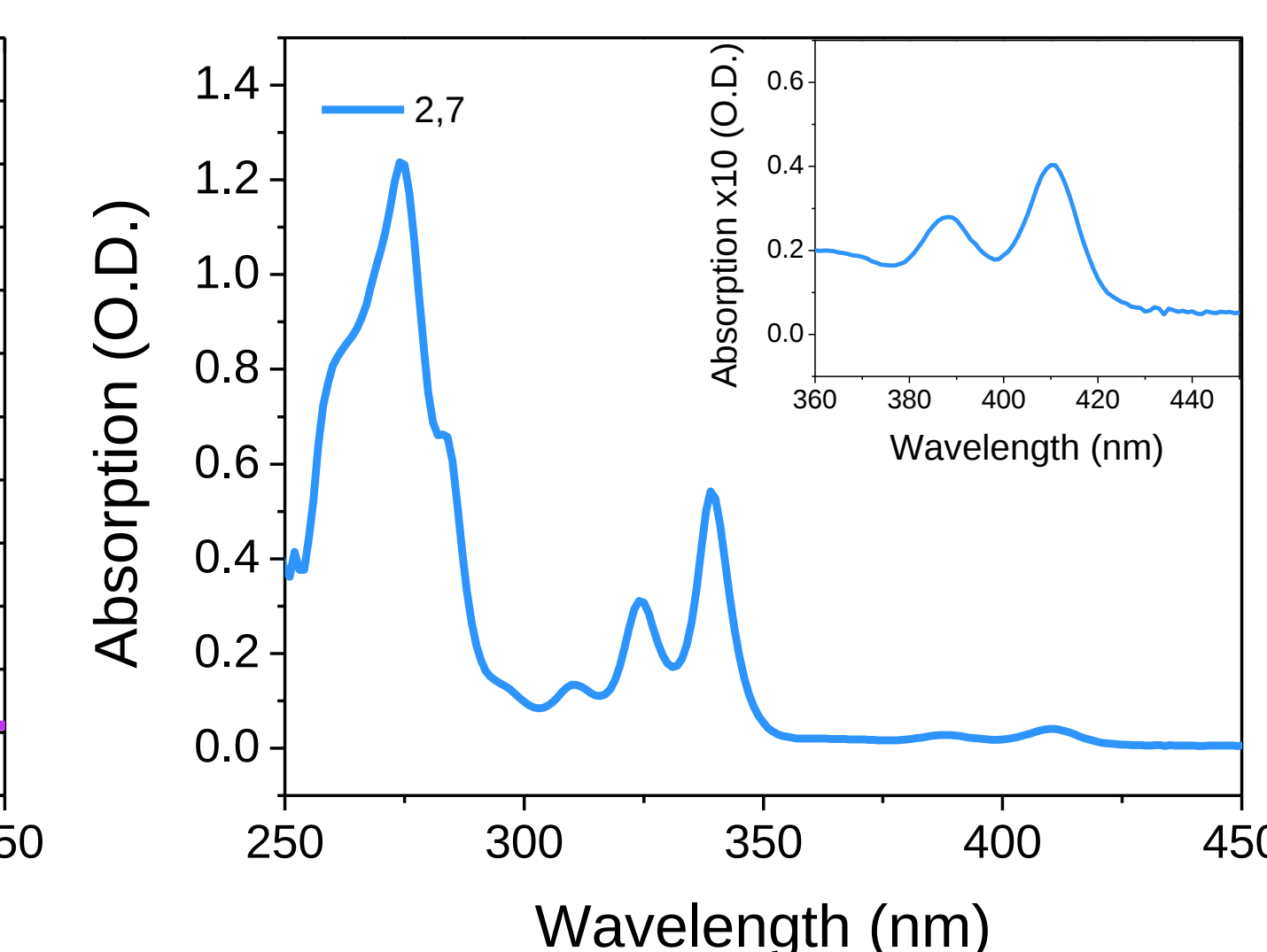
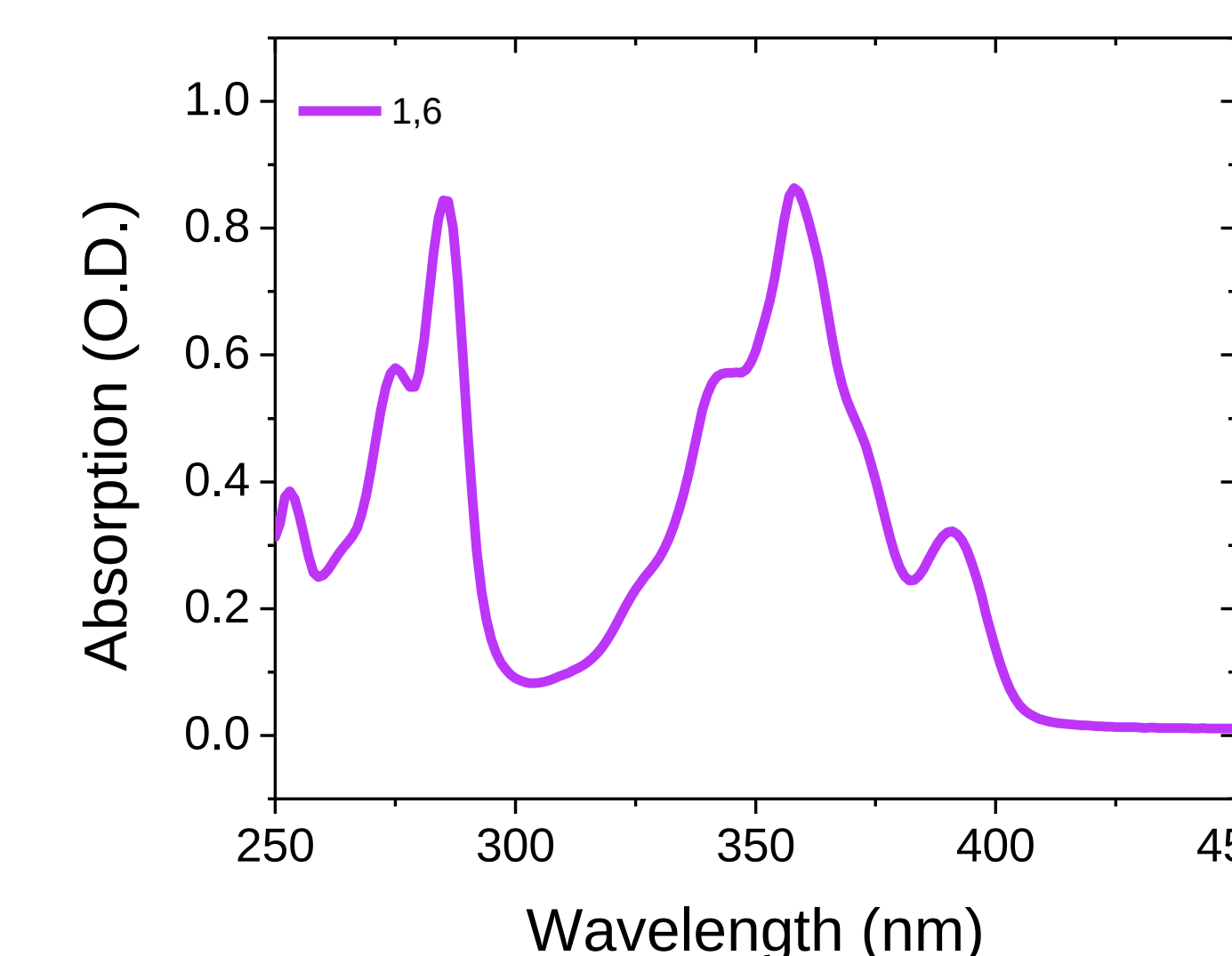


No evidence of energetic association in the ground state

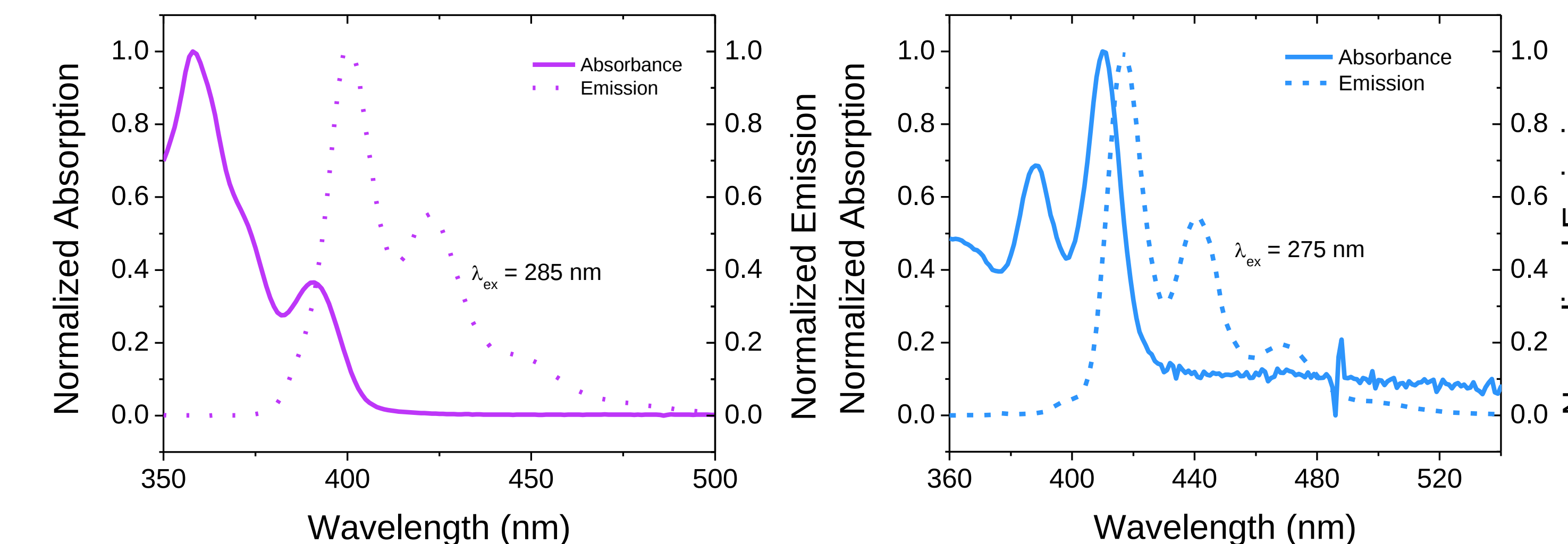
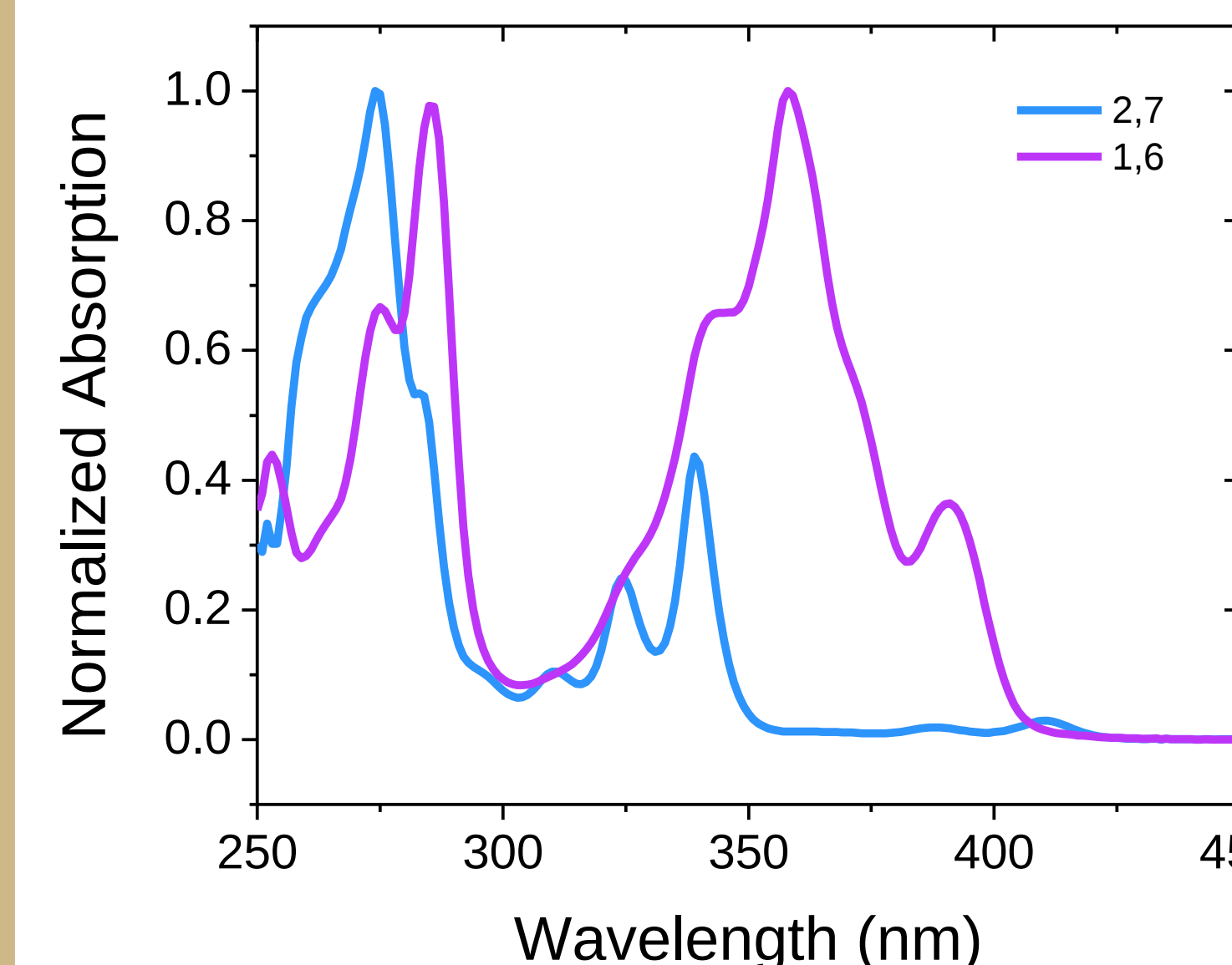
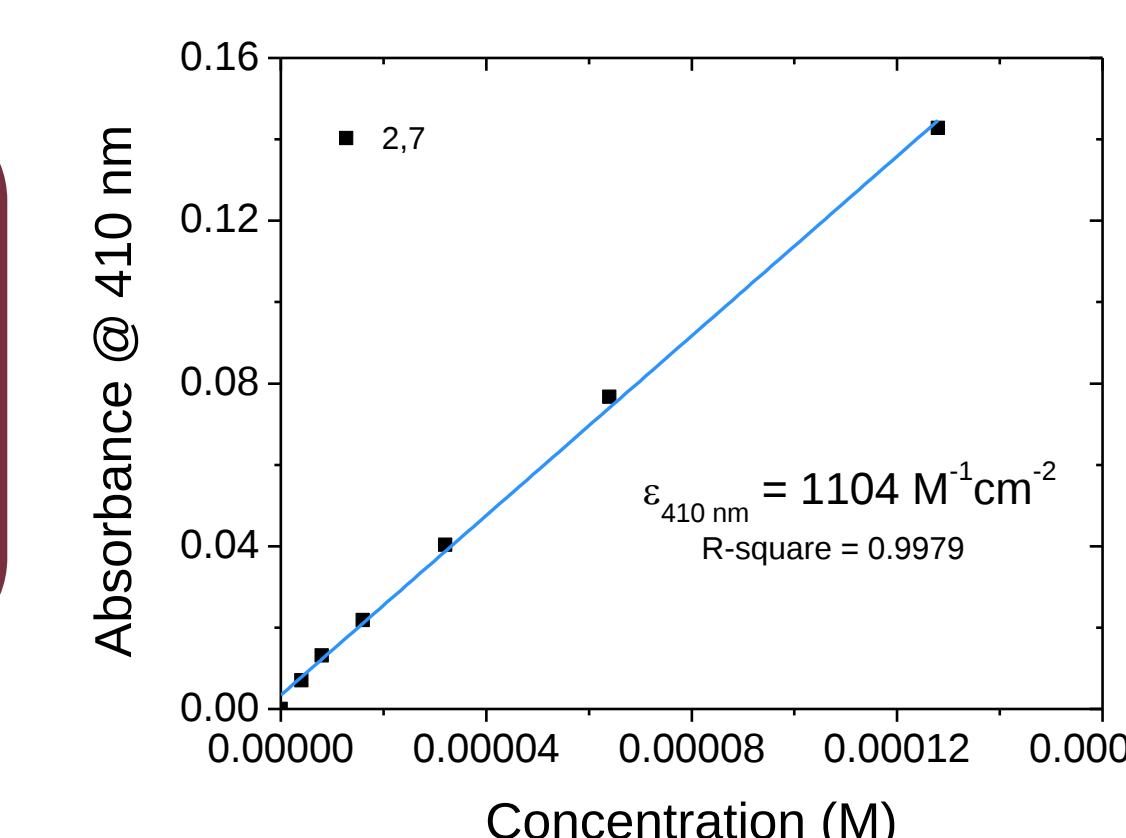


Solution Measurements

in DMSO



$S_0 \rightarrow S_1$ allowed in **1,6** but forbidden in **2,7**.



Differences in solution measurements due to **change in symmetry** caused by substituent location