Molecular Photonics
Exercise **5**

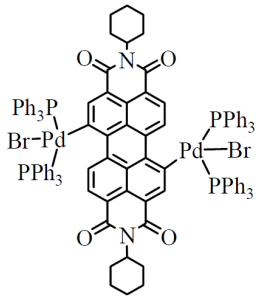
Questions 1-4 are obligatory.
Question 5 is extra. However, it is a good practice for the exam. If solved, I will comment it.

1. What is triplet harvesting in OLEDs? Why is it important and how can it be achieved?

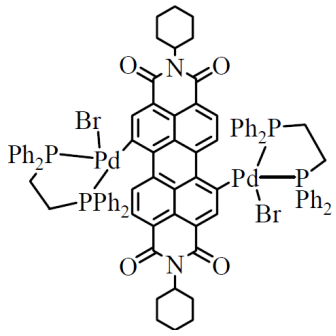
2. Consider the photosynthetic system of purple bacteria. Describe the light harvesting function of the system.

3. Transient absorption
   Explain in **general** and include a scheme on how a transient absorption instrument works.

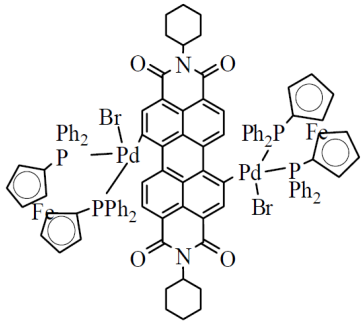
4. Case study **I**
In the supplemental paper (Inorg. Chem. 2007, describes A and B) and in the lecture material there are three PDI systems with different photophysical properties
Explain shortly:
   a. Why molecules A and B exhibit fluorescence
   b. Why molecules A and B don't exhibit phosphorescence
   c. Why molecule C does not show any emission, and explain in short how transient absorption helped in understanding the photophysics of C.



A



B



C

5. Case study **II**
In the supplemental paper (JACS 2009) the reported molecule is aggregating in aqueous solutions.
   a. What can be said on the transition dipoles interactions in the aggregate according to its UV-vis spectrum?
   b. What was learnt from the fluorescence studies of the aggregate?
   c. What exciton mobility was found for the aggregate and how was it investigated?
   d. Why photonic properties of the system are relevant to solar energy conversion?