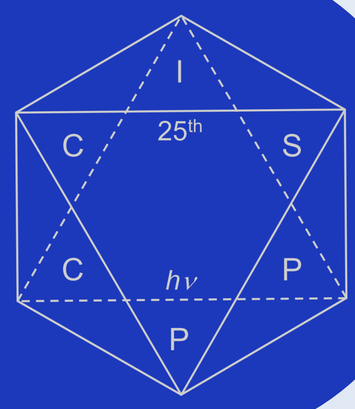
Encapsulation of a Tetra-pyridyl Porphyrin Guest in Bis(acridinium-porphyrin) Tweezers: A Photophysical Study

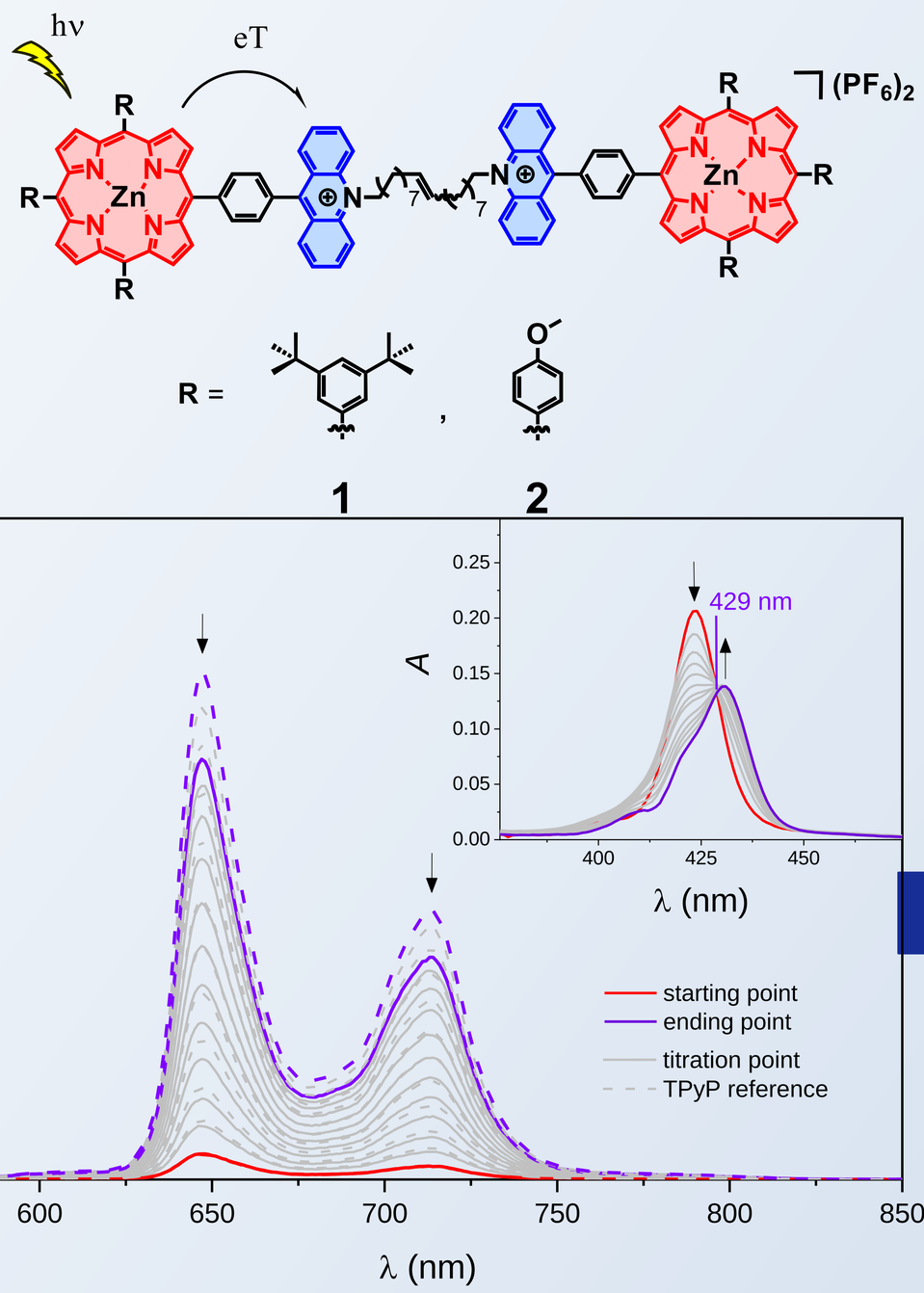


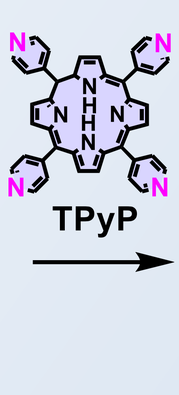
F. Ruani[1], D. Sánchez-Resa[1], A. Edo-Osagie[2], D. Serillon[2], H.-P. Jacquot de Rouville[2], C. Gourlaouen[2], V. Heitz[2], N. Armaroli[1], B. Ventura[1]

[1] *Istituto ISOF-CNR, Bologna.*
[2] *Laboratoire de Synthèse des Assemblages Moléculaires Multifonctionnels, Institut de Chimie de Strasbourg, CNRS/UMR 7177.*

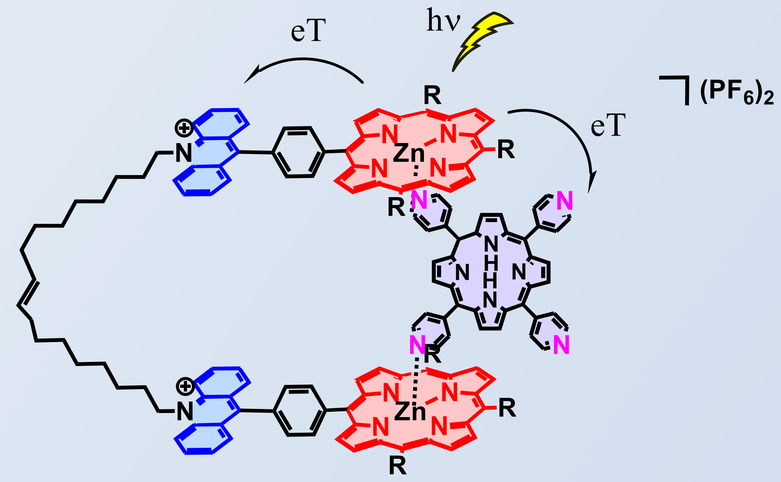
federica.ruani@isof.cnr.it

In recent years, we have investigated several multicomponent N-acridinium molecular switches and porphyrin-containing photoactive chromophores. Typically, we observed fast electron transfer (eT) processes from the porphyrin to the acridinium unit, that quench both emissions.[1,2,3] Here we present novel molecular tweezers, containing both moieties (**1**,**2**), which have been designed and investigated as receptors for photoactive guests, such as meso-(5,10,15,20-tetra(4′-pyridyl)porphyrin (**TPyP**).

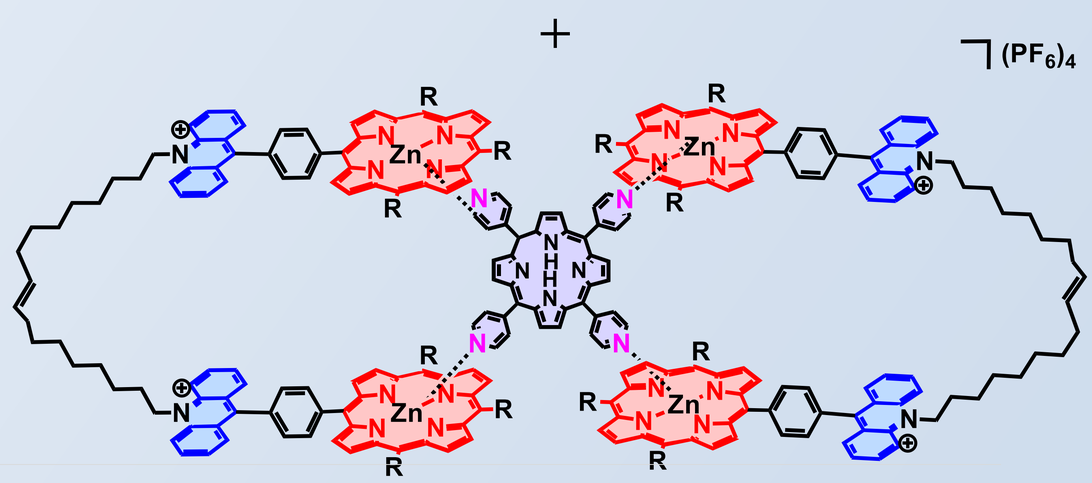




1:1



2:1



Titrations data suggest the possibility of an equilibrium between the **1**:**1** and **2**:**1** forms, with a prevalence of the **1**:**1** adduct.

From the quenching of the **TPyP** emission (Fig. 1) and from the analysis of transient absorption maps, an additional eT process occurs from the host (**1** or **2**) to the guest (**TPyP**), both in CH_2Cl_2 and in toluene.

Fig.1 Emission spectra of **2** in CH_2Cl_2 (λ_{exc} = 429 nm) upon addition of increasing amounts of **TPyP**.
Inset: absorption spectra.

To sum up, if a photoactive guest is encapsulated in these molecular tweezers not only the intramolecular eT process from the porphyrin to acridinium takes place, but also the intermolecular process towards the guest is observed.

1. A. Edo-Osagie et al., *Cr. Chim.* 2021, **24**, 47-55.
2. F. Ruani et al., *J. Porphyrins Phthalocyanines* 2023, **27**, 570–575.
3. A. Edo-Osagie et al., *J. Am. Chem. Soc.* 2023, **145**, 10691−10699.

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