Heptazines, new promising molecules in photocatalysis and organic photovoltaics; syntheses and first applications.

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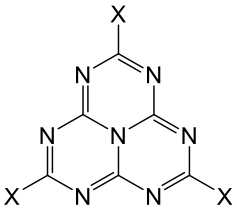
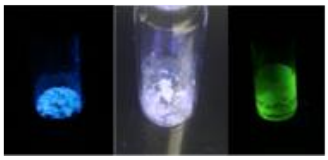
Heptazines, which count very few described examples, are among the most electron deficient high-nitrogen content, stable aromatic heterocycles (Fig. 1) [1]. This peculiarity confers them very original physico-chemical characteristics, including delayed fluorescence, a high electrochemical reduction potential, and a strong potential in organic photocatalysis. In addition, heptazines can trigger enhanced electron transport in OPV devices. However, their synthetic approach, for heptazines, is still in its infancy. We will present and comment on new strategic synthetic procedures involving this family of molecules, insisting in addition on recent results on new heptazines, and new properties.



heptazines



This lecture will therefore first recall new synthetic advances in the field of heptazines. Noticeably, a new synthetic procedure of heptazines using mechanochemistry [2], will be presented, which leads to the second heptazine known with exchangeable leaving groups. In the following, applications of heptazines in photocatalysis and as electron-injecting layers in standard OPV organic cells [3].

1) P. Audebert, E. Kroke, C. Posern and S.-H. Lee,. *Chem. Rev.* **2021**, 121, 2515.
2) L. Galmiche, T. Le, C. Allain and P. Audebert, patent filed, **2018**. P. Audebert, L. Galmiche, C. Allain, R. Guillot, T. Le, *Chem. Sci*.,**2019**, 10 ,5513.
3) I. Ibrahim Zamkoye, H. El Gbouri, R. Antony, B. Ratier, J. Bouclé, L. Galmiche, T. Trigaud and P. Audebert, *Materials* **2020**, 13, 3826.