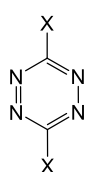


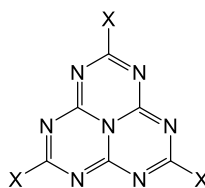
New advances in tetrazines and heptazines chemistry. Syntheses and spectroscopic properties.

Pierre Audebert, PPSM, ENS Paris Saclay

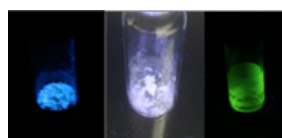
s-Tetrazines, and the far more enigmatic heptazines, which count much less described examples, are among the most electron deficient high-nitrogen content, stable aromatic heterocycles (Fig. 1). This peculiarity confers them very original physico-chemical characteristics, including delayed fluorescence, a high electrochemical reduction potential, and so on. In addition, heptazines can provide enhanced electron transport in PV devices. However, their synthetic processes, especially in the case of heptazines, is still in the infancy. We will present and comment on new strategic synthetic procedures involving these two families, along with some resulting properties.



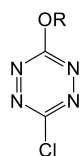
s-tetrazines



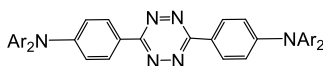
heptazines



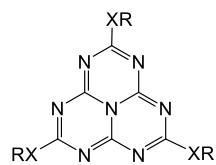
This lecture will therefore detail new synthetic advances in both fields of tetrazines, and heptazines. Noticeably, the synthetic procedure using mechanochemistry, for the second known to-date heptazine with exchangeable substituents will be detailed. Along the same track, the fluorescence, electrofluorochromism and 2-PA of several tetrazine families, will be presented, as well as new very low-viscosity tetrazine-based fluorescent liquids. The original delayed fluorescence of heptazines, will be introduced, along with first results in photocatalysis. Examples featuring the molecules concerned are gathered in the Scheme 1 below.



s-tetrazines for
electrofluorochromism



s-tetrazines for
2PA



new heptazines
X = S or NR