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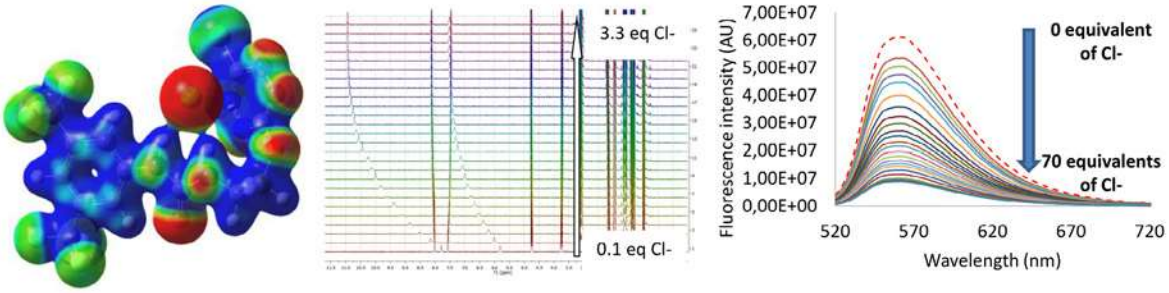
SYNERGISTIC HYDROGEN BONDING AND ANION-∏ INTERACTION IN NEW ANION RECEPTOR PLATFORMS : STRUCTURE-PROPERTIES RELATIONSHIP AND MOLECULAR RECOGNITION

Romain Plais [1], Guy Gouarin [1], Anne Gaucher [1], Gilles Clavier [2], Jean-Yves Salpin [3], Damien Prim [1],

[1]*Institut Lavoisier de Versailles, Université de Versailles Saint Quentin en Yvelines, Université Paris Saclay, UMR CNRS 8180 - Versailles (France),*
[2]*Laboratoire de Photophysique et de Photochimie Supramoléculaire et Macromoléculaire, Ecole Normale Supérieure Paris Saclay, UMR CNRS 8531 - Cachan (France),*
[3]*Laboratoire Analyse et Modélisation pour la Biologie et l'Environnement, Université d'Evry Val d'Essonne, Université Paris Saclay, UMR CNRS 8587 - Evry (France)*
romain.plais@uvsq.fr (Romain Plais)
damien.prim@uvsq.fr (Damien Prim)

Chloride anion is a widely spread anion in several areas such as biology, medicine, catalysis and environment. [1] As an example, chloride anions are deeply involved in diseases such as channelopathies through the regulation of membrane potential. [1] Therefore, the development of anion receptors is a milestone in today›s organic chemistry. Despite the widespread use of cation receptors, [2] molecular recognition by anion receptors is still in her infancy. The prediction and understanding of their mechanism of action as well as forthcoming applications are current challenges in chemistry and frontier domains.
The development of such molecules is based on the use of one or multiple weak interactions such as anion-π interactions, [3] halogen or hydrogen bonding but also hydrophobic effects. Individually, they contribute to the structuration of complex three-dimensional receptors, but associated within a single polyfunctional molecular platform, they are likely to generate stronger and more selective bindings.
In this context, we designed new anion receptor platforms comprising both a hydrogen-bond donor and a π-deficient heterocycle generating anion-π interactions but also fluorescence. Their synergistic roles towards anion recognition are evidenced. A theoretical study of complexation potential by DFT calculations will validate the concept. The complexation will be discussed by a broad scope of experimental methods (high resolution mass spectroscopy, NMR, UV-Visible, Fluorescence and Decays titrations). [4]



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