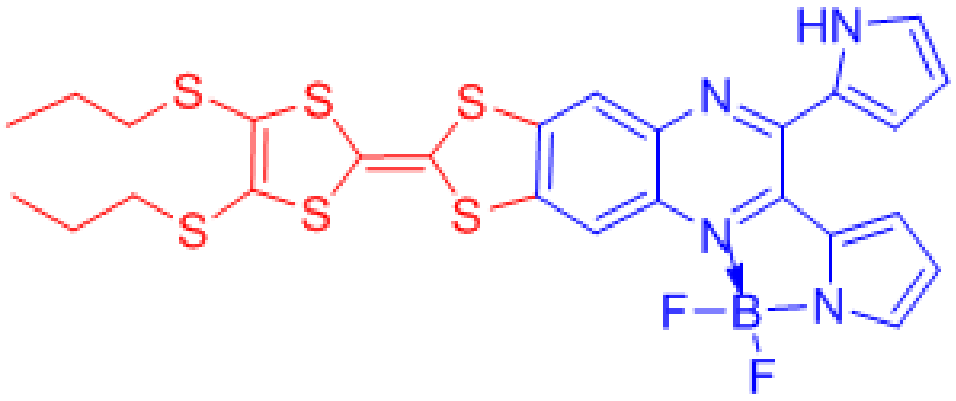
A donor-acceptor ensemble: merging of TTF and dipyrrolylquinoxaline difluoroborate chemistry

P. Zhou[1], U. Aschauer[1], T. Feurer [2], R. Häner[1], S. Liu[1]

[1]Department of Chemistry and Biochemistry, University of Bern, [2]Institute of Applied Physics

Tetrathiafulvalene(TTF)-fused donor-acceptor (D–A) ensembles are of high interest due to their unique (opto)electronic properties and potential applications in organic conductors, photovoltaics, sensors, switches and molecular electronics.[1, 2] A direct annulation of a TTF with a variety of electron-acceptors has been achieved for studying photo-induced intramolecular charge transfer (ICT) as well as the photogeneration of long-lived charge separated states in resultant D-A systems.[3] Herein, we describe redox and optical properties of a new D–A ensemble (Chart 1) which was prepared by complexation of BF_2 with a TTF-fused 2,3-di(1*H*-2-pyrrolyl)quinoxaline ligand. A detailed experimental and theoretical study of an ICT process in TTF-QB is presented.



[1] Bergkamp, J. J.; Decurtins, S.; Liu, S. X., Current advances in fused tetrathiafulvalene donor-acceptor systems. *Chem. Soc. Rev.* **2015,** *44* (4), 863-74.
[2] Jana, A.; Ishida, M.; Park, J. S.; Bahring, S.; Jeppesen, J. O.; Sessler, J. L., Tetrathiafulvalene-(TTF-) Derived Oligopyrrolic Macrocycles. *Chem. Rev.* **2017,** *117* (4), 2641-2710.
[3] Pfattner, R.; Pavlica, E.; Jaggi, M.; Liu, S.-X.; Decurtins, S.; Bratina, G.; Veciana, J.; Mas-Torrent, M.; Rovira, C., Photo-induced intramolecular charge transfer in an ambipolar field-effect transistor based on a π-conjugated donor–acceptor dyad. *J. Mater. Chem. C* **2013,** *1* (25).