Combining TMTSF and BEDT-TTF with Anionic $(TaF_6)_{1-x}/(PF_6)_x$ Alloys for New Molecular Conductors

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In the course of our studies on TTF based conductors containing fluorotantalate anions, we have recently decided to undertake a systematic study on the crystalline materials obtained by the electrocrystallization of TMTSF and BEDT-TTF with $(n\text{-}Bu_4N)TaF_6$ and with alloys of different compositions containing both $(n\text{-}Bu_4N)TaF_6$ and $(n\text{-}Bu_4N)PF_6$. The anionic ratio in the different radical cation salts $(TMTSF)_2(TaF_6)_{1-x}(PF_6)_x$ and $(BEDT\text{-}TTF)_2(TaF_6)_{1-x}(PF_6)_x$ starting from variable TaF_6/PF_6 compositions has been precisely determined by single crystal X-ray diffraction analyses corroborated with ^{19}F NMR spectroscopy measurements of the bulk crystalline materials. The electron transport properties of some of the mixed anionic salts together with those of a new 1:1 BEDT-TTF/TaF_6 phase have been determined [4].

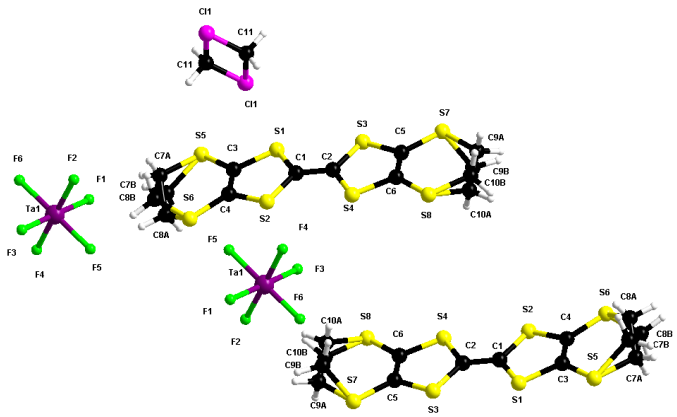

Fig. 1. Molecular structure of $(BEDT\text{-}TTF)_2(TaF_6)_2.CH_2Cl_2$. The two carbon atoms of the two ethylene parts were disordered over two positions with refined partial occupancy factors (0.62/0.38) and (0.51/0.49).

References

[1] M. Allain *et al*., *Crystals* **11**, 386 (2021).