

Radical Cation Salts of TTF Donors with the Ta₂OF₁₀ Dianion

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Puzzled by the unusual conducting behavior of the as described (TMTSF)₃Ta₂F₁₁ radical cation salt ^[1] (TMTSF = tetramethyl-tetraselenafulvalene) and the potential interest of the Ta₂F₁₁ monoanion in other molecular conductors, we have decided to revisit and extend the family of TTF radical cation salts containing this particular anion. During our investigation it turned out that the real anionic species was in fact the Ta₂OF₁₀ dianion ^[2].

In this work we describe the structures, conductivity, and band structure calculations of the (TMTXF)₃Ta₂OF₁₀ hybrid salts (X = S or Se). We also present the new (DM-EDT-TTF)₃Ta₂OF₁₀ materials based on the chiral donor dimethyl-ethylenedithio-tetrathiafulvalene (DM-EDT-TTF) and a new (BEDT-TTF)₃Ta₂OF₁₀ salt.

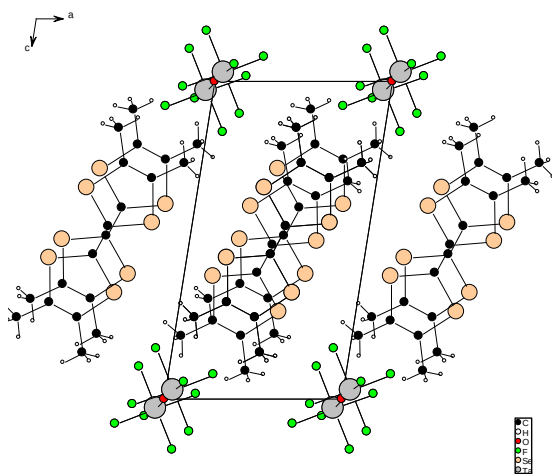


Fig. 1. Crystalline structure of (TMTSF)₂Ta₂OF₁₀

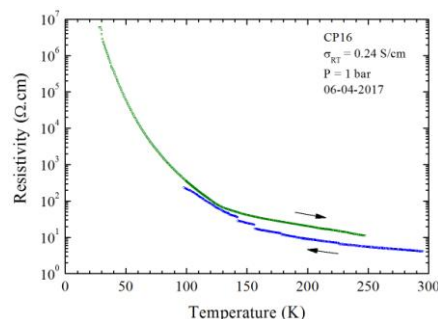


Fig. 2. Single crystal resistivity of (TMTSF)₂Ta₂OF₁₀

References

- [1] C. Lenoir, K. Boubekeur, P. Batail, E. Canadell, P. Auban, O. Traetteberg, D. Jérôme, *Synth. Met.*, **42**, 1939-1942 (1991).
- [2] N. Mroweh, C. Mézière, M. Allain, P. Auban-Senzier, E. Canadell, N. Avarvari, *Chem. Sci.*, **11** (37), 10078-10091 (2020).