

# Our quest for Single Component Molecular Metals

**Dulce Belo,<sup>1,2</sup> M.F.G. Velho<sup>2</sup>, R.A.L. Silva<sup>2</sup>**

<sup>1</sup> *Departament of Nuclear Sciences and Engineering, Instituto Superior Técnico, Universidade de Lisboa, E.N. 10, P-2695-066 Bobadela LRS, Portuga, e-mail: dbelo@ctn.tecnico.ulisboa.pt*

<sup>2</sup> *C2TN, Centro de Ciências e Tecnologias Nucleares, Instituto Superior Técnico, Universidade de Lisboa, E.N. 10 ao km 139.7, 2695-066 Bobadela LRS, Portugal*

Twenty years ago, the molecular materials community watched in wonder to the report of the first single component molecular metal (SCMM). Until then, all molecular metals were composed of a pair of partially oxidized species but since then, the paradigm changed, and nowadays numerous examples of SCMM can be found in literature.

As proven by the two firstly reported SCMM -  $[\text{Ni}(\text{tmdt})_2]$  (tmdt: trimethylenetetrafulvalenedithiolate) [1] and  $[\text{Au}(\alpha\text{-tpdt})_2]$  ( $\alpha\text{-tpdt}$ : 2,3 thiophenedithiolate) [2] - by their nature, neutral bis(1,2-dithiolene) and bis(1,2-diselenolene) transition metal complexes are, by far, the best candidates to obtain a SCMM. With that in mind our quest has been focus on the exploration of transition metal complexes based on dithiophene ligands. In this presentation it will present our most relevant achievements, contextualized in the overall panorama of SCMM [3].

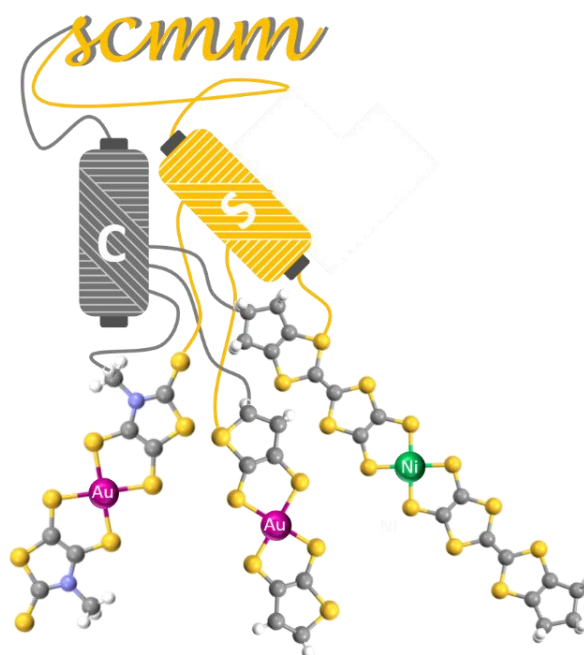


Fig. 1

## References

- [1] H. Tanaka, Y. Okano, H. Kobayashi, W. Suzuki and A. Kobayashi, *Science* **291**, 285–287 (2001)
- [2] D. Belo, H. Alves, E. B. Lopes, M. T. Duarte, V. Gama, R. T. Henriques, M. Almeida, A. Pérez-Benítez, C. Rovira and J. Veciana, *Chem. Eur. J.* **7**, 511–519 (2001).
- [3] M.F.G. Velho, R.A.L. Silva, Dulce Belo, *J. Mater. Chem. C* **9**, 10591-10609 (2021)