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CHIRAL MATERIAL AND THE ELECTRONS' SPIN - A MIRACULOUS MATCH

ABSTRACT

Spin based properties, applications, and devices are commonly related to magnetic effects and to magnetic materials. However, we found that chiral molecules, crystals, and films act as spin filters for photoelectrons transmission, in electron transfer, and in electron transport.

The effect, termed Chiral Induced Spin Selectivity (CISS),(1) was found, among others, in bio-molecules and in bio-systems as well as in chiral oxides and in chiral perovskites. It has interesting implications for the production of new types of spintronics devices, (2) in controlling magnetization,(3) and on electron transfer and conduction. It also enables the introduction of new type of catalysts, especially for oxygen related processes. We also found that charge polarization in chiral molecules is accompanied by spin polarization. This

finding shed new light on spin dependent interaction between chiral molecules and between them and magnetic surfaces.(4)

Further reading

1. R. Naaman, Y. Paltiel, D.H, Waldeck, J. Phys. Chem. Lett., 11 (2020) 3660.
2. K. Michaeli, V. Varade, R. Naaman, D. A Waldeck, J. of Physics: Condensed Matter. 29 (2017) 103002.
3. E. Z. B. Smolinsky et al. J. Phys. Chem. Lett. 10 (2019) 1139.
4. K. Banerjee-Ghosh, et al., Science 360 (2018) 1331.

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