Chiral Molecules and the Electron’s Spin- From Spintronics to Enantio-Separation

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Spin based properties, applications, and devices are commonly related to magnetic effects and to magnetic materials. However, we found that chiral organic molecules act as spin filters for photoelectrons transmission,\(^1\) in electron transfer,\(^2\) and in electron transport.\(^3\)

The new effect, termed Chiral Induced Spin Selectivity (CISS),\(^4,5\) was found, among others, in bio-molecules and in bio-systems. It has interesting implications for the production of new types of spintronics devices\(^6,7\) and on electron transfer in biological systems.\(^8\) Recently we found that charge polarization in chiral molecules is accompanied by spin polarization.\(^9\) This finding shed new light on enantio-specific interactions and it opens the possibility to construct novel methods for enantio-separation.

References: