

New interesting way to rectify current thanks to Ferrocenyl Triazole derivatives

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Rectification of current by molecules is a subject that attracts many attentions nowadays because it would permit to reduce the size of the electronic devices. Theorized by Aviram and Ratner, the rectification can be achieved by an asymmetric molecule, enabling the electrons to be transferred in a preferential direction through the molecule. The state of the art of the organic molecular rectifiers shows rectification ratios up to 10^5 .¹ Such rectification ratios were obtained with molecules composed of a ferrocene, which is the key of the rectification process, linked to an insulating alkyl chain. At present, not so much efforts have been devoted to control the orientation of the molecular rectifiers, relative to the electrode (See Figure 1).² In our case, such a control of the molecular orientation has been obtained by a two-step process based on Click Chemistry.

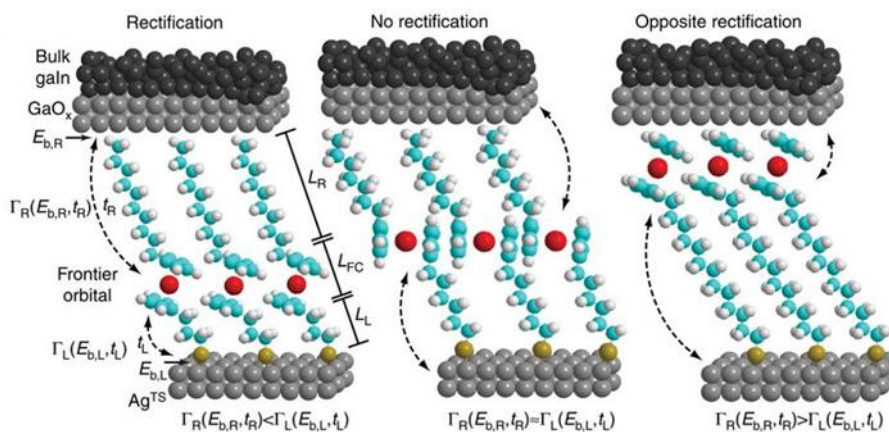


Figure 1 Importance of position of ferrocene in the rectification

Here, we present unprecedented works on the synthesis of new ferrocene derivatives designed as molecular rectifiers. Especially, a special effort is devoted: firstly, to allow the molecule to be covalently linked to an electrode and secondly to definitely control the orientation of the molecular rectifier relative to the electrode.

1 X. Chen, M. Roemer, L. Yuan, W. Du, D. Thompson, E. del Barco, C.A. Nijhuis, *Nat. Nanotechnol.* **2017**, *12*, 797.

2 L. Yuan, N. Nerngchamnon, L. Cao, H. Hamoudi, E. del Barco, M. Roemer, R.K. Sriramula, D. Thompson, C.A. Nijhuis, *Nat. Commun.* **2015**, *6*, 6324.