

New Approaches to [60]Fullerene-based Molecular Structures

- N. Martín (Departamento de Química Orgánica. Facultad de Química. Universidad Complutense)

During the last years we have been actively engaged in the chemistry of fullerenes directed to the study of new cycloaddition reaction to C₆₀¹ as well as to the design and synthesis of novel C₆₀-based donor-acceptor molecular ensembles.² In particular, we have widely developed the synthesis and study of structural and electrochemical properties of C₆₀-TTF and C₆₀-exTTF (TTF: tetrathiafulvalene; exTTF: p-quinonoid π -extended tetrathiafulvalene) dyads³ and triads⁴. Remarkably, the use of these strong electron donors which gain aromaticity upon oxidation resulted to have a strong impact on the stabilization of the photoinduced charge separated state.

On the other hand, π -extended chromophores such as π -conjugated oligomers⁵ or dendrimers⁶ have been also covalently connected to [60]fullerene and, depending on their electronic nature, interesting energy and/or electron transfer processes were observed in their photophysical studies.

In this communication we will present our recent studies on new C₆₀-based molecular structures directed to improve the photophysical properties in the search of chemical and photovoltaic applications.

References

1. a) N. Martín, M.A. Martínez-Grau, L. Sánchez, C. Seoane, M. Torres, *J. Org. Chem.* **1998**, *63*, 8074. b) J.L. Segura, N. Martín, *Chem. Rev.* **1999**, *99*, 3199.
2. N. Martín, L. Sánchez, B. Illescas, I. Pérez, *Chem. Rev.* **1998**, *98*, 2527.
3. a) N. Martín, L. Sánchez, M.A. Herranz, D.M. Guldi, *J. Phys. Chem. A.* **2000**, *104*, 4648-4657; b) D.M. Guldi, S. González, N. Martín, A. Antón, J. Garín, J. Orduna, *J. Org. Chem.* **2000**, *65*, 1978-1983.
4. a) N. Martín, I. Pérez, L. Sánchez, C. Seoane, *J. Org. Chem.* **1997**, *62*, 5690-5695; b) M.A. Herranz, N. Martín, *Org. Lett.* **1999**, *1*, 2005-

2007; c) N. Martín, L. Sánchez, D.M. Guldi, *Chem. Commun.* **2000**, 113-114.

5. a) J.L. Segura, R. Gómez, N. Martín, C. Luo, D.M. Guldi, *Chem. Commun.* **2000**, 701. b) D.M. Guldi, C. Luo, A. Swartz, R. Gómez, J.L. Segura, N. Martín, C. Brabec, N.S. Sariciftci, *J. Org. Chem.* **2002**, *67*, 1141.
6. D.M. Guldi, A. Swartz, C. Luo, R. Gomez, J.L. Segura, N. Martín, *J. Am. Chem. Soc.* **2002**, *124*, 10875.