

Making Carbon–Phosphorus Bonds with Visible light: Challenges and Opportunities

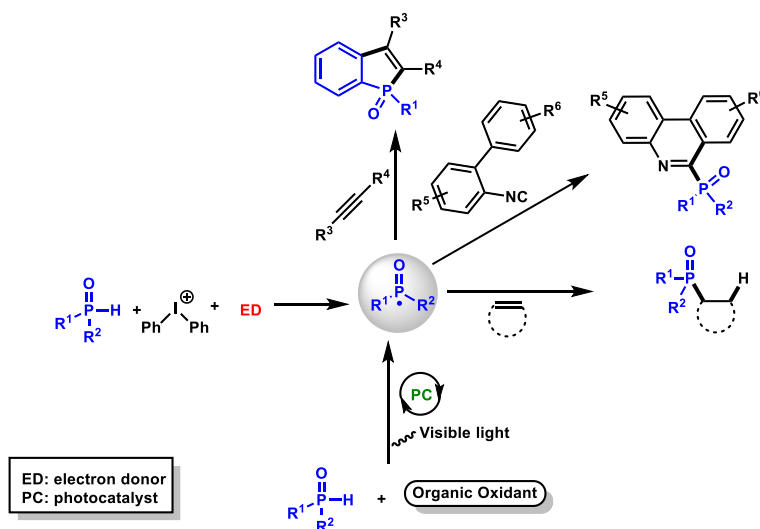
Sami Lakhdar

CNRS–Laboratoire de Chimie Moléculaire et Thio-organique, ENSICAEN, Université de Caen Basse-Normandie, CNRS, 6 Boulevard du Maréchal Juin, 14050 Caen, France

sami.lakhdar@ensicaen.fr

Reactions involving phosphorus centered radicals play a pivotal role in the construction of organophosphorus ligands, biologically active molecules and π -conjugated molecules.¹ Common synthetic approaches for the generation of such radicals imply the use of harsh reaction conditions.

In this presentation, we show that access to a large variety of organophosphorus compounds can be achieved under mild reaction conditions through: *i*) visible light photoredox catalysis or *ii*) visible light irradiation of Electron–Donor–Acceptor complexes (EDA). The scope and limitations of these methods will be discussed with a special focus on their mechanistic aspects.²



References:

- 1) a) D. E. C. Corbridge, *Phosphorus: Chemistry, Biochemistry and Technology*, 6th ed.; CRC Press: Boca Raton, FL, **2013**; b) L. D. A. Quin, *Guide to Organophosphorus Chemistry*; Wiley Interscience: New York, **2000**; c) P.-A. Bouit, A. Escande, R. Szucs, D. Szieberth, C. Lescop, L. Nyulszi, M. Hissler, R. Réau, *J. Am. Chem. Soc.* **2012**, *134*, 6524.
- 2) a) V. Quint, F. Morlet-Savary, J-F. Lohier, J. Lalevé, A-C. Gaumont, S. Lakhdar, *J. Am. Chem. Soc.* **2016**, *138*, 7436–7441. b) L. Noël-Duchesneau, E. Lagadic, F. Morlet-Savary, J-F. Lohier, I. Chataigner, M. Breugst, J. Lalevé, A-C. Gaumont, S. Lakhdar, *Org. Lett.* **2016**, *18*, 5900–5903. c) G. Fausti, F. Morlet-Savary, J. Lalevé, A.-C. Gaumont, S. Lakhdar, *Chem. Eur. J.* **2017**, *23*, 1–6 ; d) for a recent review, see : V. Quint, L. Noël-Duchesneau, E. Lagadic, F. Morlet-Savary, J. Lalevé, A.-C. Gaumont, S. Lakhdar, *Synthesis*, **2017**, *49*, 3444–3452.