

**Title**  
**Phosphorus derivatives in organocatalysis:**  
**A journey from P(III) to P(V)**

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Phosphorus derivatives are existing at different oxidation states. Beside their uses as ligands in transition metal catalyzed reactions, an expanding field of research has emerged in the past recent years focusing on their organocatalytic properties.

However, behind this simple word lies a potential that is still under-exploited by synthetic chemistry and partially addressed in the various literature reviews. The richness of phosphorus oxidation states allowed the emergence of effective organocatalysts which have considerably extended the synthetic toolbox of our everyday life as synthetic chemists.

In this presentation, we will explore the different oxidation states of phosphorus-based catalysts and their original contributions in organic reactions. We will also present how to disrupt an organocatalyzed reaction to have afterward a multicomponent reaction, simply playing with the nature of the phosphorus substituents, thus opening the doors to another aspect of reactivity in organic chemistry.

## CV

David VIRIEUX received his PhD in 1999 under the Guidance of Professor Henri-Jean Cristau in Montpellier. At that time, his work was already focusing on phosphorus compounds. He synthesized various polyphosphine polyoxides for the selective extraction of radionuclides from nuclear wastes or human body.

After a short period in industry (Rhône-Poulenc agrochemistry in the USA), where he synthesized different families of heterocyclic derivatives as potential insecticides, he joined the Ecole Nationale Supérieure de Chimie de Montpellier as Assistant Professor.

In 2005, he passed his habilitation and became full professor in the same institution in 2007. Since 2005, he manages the Graduate Major "Fine Organic Chemistry" and he is the referee for the school director concerning all questions related to employment and to professional insertion of the students.

In research, he is Deputy Director of AM2N team (Charles Gerhardt Institute - UMR CNRS 5253). His main research topics focus on organic synthesis in relation to life sciences, more specifically in the development of phosphorus molecules for pharmaceutical (anticancer, antiviral, antidepressant) and agrochemical (fungicides, herbicides) applications. A substantial part of his work is also dedicated to the development of new methodologies, including multicomponent reactions, organocatalysis and enantioselective syntheses. He maintains very strong connections with industry - More than 14 industrial contracts over the period 2005-2017 mainly in the field of life sciences, with large groups (Bayer CropScience, Servier) or smaller ones (Neuréva, Idenix, BCI pharma). He is one of the founding member of Phost'In (2014), a start-up based on the team's research on a new family of compounds targeting glycosylation processes. He is the author of 79 publications, 4 patents and 8 book chapters and already managed 19 PhD thesis.

## Prof. David VIRIEUX



### Personal details

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### Professional details

Grade: Professor 1st class (since 01-09-2015)  
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### Education Background:

#### Career – Appointments

01/09/2015	Professor “1 <sup>st</sup> class” (PR1) National Graduate School of Chemistry (ENSCM) - Montpellier
01/09/2007	Professor “2 <sup>nd</sup> class” (PR2) National Graduate School of Chemistry (ENSCM) - Montpellier
01/12/2005	Habilitation
01/09/1999	Assistant Professor National Graduate School of Chemistry (ENSCM) – Montpellier
01/12/1998	Researcher for Rhône-Poulenc Ag Co (Research Triangle Park – North Carolina, USA)

#### Education

<b>Habilitation</b>	Habilitation – 01/12/2005 – University of Montpellier 2
<b>PhD Thesis</b>	PhD thesis - Laboratory of Organic Chemistry - <i>University of Montpellier 2</i> - June 6, 1998 Synthesis of polyoxide polyphosphines, selective complexing agents for extraction and decontamination of actinides
<b>MSc (DEA)</b>	Heterochemistry, polymers and catalysis from University of Montpellier (1993)
<b>Engineer</b>	National Graduate School of Chemistry - Montpellier (1993)
<b>BSc</b>	Chemical Institute of Technology - Montpellier (1990)

### Working Background:

#### Miscellaneous informations

<b>ICGM</b>	Vice-director of the team “Architectures Moléculaires et Macromoléculaires” – Institut Charles Gerhardt – UMR CNRS 5253
<b>ENSCM</b>	Head of the Fine Organic Chemistry Major (2005-). Head of the Organic Chemistry teaching Staff (6 professors and 5 assistant Professors – 2005-). Since 2002 involved in 5 evaluations of ENSCM by official French Evaluation Agency for Research and Higher Education (AERES and CTI).
<b>Society</b>	Member of the French Chemical Society
<b>Research</b>	Thesis supervisor of 19 PhD