

## Dr. Alex Lemarchand

Post-doctoral research fellow

Adress: Laboratoire de Chimie des Processus Biologiques  
Collège de France  
11 Place Marcelin Berthelot  
75005 Paris, France

Collaboration: Laboratoire de Chimie de la Matière Condensée  
de Paris  
Institut Lavoisier de Versailles

Phone number: +33(0) 1 44 27 15 27

E-mail: alex.lemarchand@college-de-france.fr



### Research interests

- Materials chemistry
- Nanostructured materials (metal oxide nanocrystals, layered double hydroxides, metal organic frameworks, etc.)
- X-ray diffraction techniques
- Structural characterization methods: pair distribution function, Rietveld refinement
- Atomic-scale modelling methods
- Chemical synthesis route (co-precipitation, sol-gel)

### Summary

I obtained my Ph.D in the field of ceramic materials science from University of Limoges in December of 2018. My Ph.D research focused on the synthesis by soft chemistry and the structural study of metal oxide nanocrystals ( $\text{SnO}_2$ ,  $\text{TiO}_2$ ,  $\text{ZnO}$ ) of just a few nanometers. Through this work, I developed skills in the synthesis of nanocrystals by chemical routes, mainly non-aqueous or non-hydrolytic sol-gel methods, and in the structural characterization of disordered materials using in particular the pair distribution function method coupled with atomic-scale modelling methods. As a post-doc at Collège de France, my current research concerns the structural characterization of POM@MOFs photocatalytic systems. The aim is to improve the understanding of the atomic scale structure and establish the structure-properties linkage in such complex systems. Here, pair distribution function methods are appropriate for locally probing the POM and its environment by collecting POM@MOF pair distribution functions.

### Publications

- 2017**
- R. Sousa, J. Jouin, O. Masson, F. Remondiere, A. Lemarchand, M. Colas, P. Thomas, J. Lameira, G.N.T. Bastos, A.B. Lima, J.L.M. Nascimento, M. Anicete-Santos, W.R. Monteiro et C.N. Alves, Structure and analgesic properties of layered double hydroxides intercalated with low amounts of ibuprofen, *Journal of American Ceramic Society*, 100 (6), 2017, 2712–2721