



## H2020-MSCA-ITN-2019-EJD - [www.ccimc.eu](http://www.ccimc.eu)

Ph.D. position available: 10/2020 – 9/2023

ESR6 Project: Activation of carbon dioxide with highly Lewis acidic compounds

Thesis co-directors: **Prof. Matthias Westerhausen,\* Dr. Sven Krieck,\*  
and Prof. Sébastien Bontemps**

\* Friedrich Schiller University Jena (FSU), Jena, Germany (Recruiting institution)

\*\* Centre National de la Recherche Scientifique-LCC (CNRS-LCC), Toulouse, France

Secondment host: **IFP Energies nouvelles** (IFPEN), France

**Context:** The 4e-reduction of CO<sub>2</sub> is the most difficult but the one giving rise to the most versatile reactivity. With this project, we expect to disclose new 4e-reduction systems with alkali, alkaline earth and earth elements and exploit such results to further enlarge the scope of CO<sub>2</sub> transformations. The PhD student will be trained in various fields spanning from isolation of highly sensitive complexes to gas handling and academic and industrial catalytic reactions.

**Objectives:** Hydrides and alkyl derivatives of alkali, alkaline earth and earth elements will be prepared in order to activate carbon dioxide. The double M-H bond addition across the C=O bond of CO<sub>2</sub> will be particularly targeted in order to give rise to acetal or formaldehyde. This project will benefit from the complementary expertise of the two groups on earth abundant compounds and CO<sub>2</sub> chemistry. The most promising complexes will be tested at IFPEN in various processes of interest.

**Expected profile:** We are seeking excellent Ph.D. students (Early Stage Researchers, ESRs, at the date of recruitment in the first 4 years of their research career) for an international Ph.D. program to obtain a double-degree from the FSU Jena, Germany, and the CNRS-LCC Toulouse, France. The ESR (Ph.D. student) must be ambitious to work in an international European team. Advanced knowledge in coordination and organometallic chemistry with air-sensitive compounds is highly desirable for successfully dealing with the objective of this project. At the date of recruitment, the applicant has not resided or carried out the main activity in Germany for more than 12 months in the 3 years immediately before the recruitment date (see eligibility rules for applicants in [www.ccimc.eu](http://www.ccimc.eu)). **Applications will be considered up to April 15, 2020.**

This thesis will be part of an International Training Network (ITN) and more specifically a European Joint Doctorate (EJD), funded by the European Commission through the Marie Skłodowska-Curie Action (MSCA), entitled "Coordination Chemistry Inspires Molecular Catalysis" (CCIMC). This program involves 15 joint theses. You are encouraged to consider all these thesis projects, to be consulted on the ITN-EJD website [www.ccimc.eu](http://www.ccimc.eu).

**Application:** Please send a CV and a motivation letter together with two reference letters to [m.we@uni-jena.de](mailto:m.we@uni-jena.de), [sven.krieck@uni-jena.de](mailto:sven.krieck@uni-jena.de), [sebastien.bontemps@lcc-toulouse.fr](mailto:sebastien.bontemps@lcc-toulouse.fr).

**Further details can be found at:** <http://www.ccimc.eu>