Program of the course ED Carnot Pasteur 2025 / 2026

[D1] Materials from molecular precursors – advanced doctorate courses

J.-C. Hierso, (ICMUB), 03 80 39 61 07, Jean-Cyrille.Hierso@u-bourgogne.fr

1. Synthesis of materials from molecular precursors and applications

Materials for and by chemical deposition in vapor phase of organometallic compounds (OMCVD) :

- Description of the deposition techniques (Physics, Chemistry)
- Fundamental stages in CVD (mechanisms)
- Properties and classification of molecular precursors
- Brief description of CVD reactors and some of their variations (LCVD, PECVD, RPCVD,
- CBE, ALD, VPE...),
- Particular applications: thick films, heterogeneous catalysts

Materials and catalysis :

- Basics of catalysis and its domains of application
- The different types of catalysts, advantages and disadvantages
- Nature of the active sites, characterization, correlation structure-activity
- Design and preparation by a bottom-up approach
- The new challenges - Green Chemistry - examples
- New renewable raw materials, molecular catalysis

2. Understanding/presenting a publication out of your field (tutorial Group Work)

- Individual choice of a paper for each participant to be studied/presented by another participant
- Presentation of the publication by another PhD participant
- Question remarks tour by the college of participant
- Comments/corrections by the original selector

3. Doctoral supervision – Role and expectations of the PhD student/supervisors