We ask for an oral communication

SUPERCRITICAL MICRO- AND MILLIFLUIDIC SYNTHESIS OF ADVANCED NANOSTRUCTURED MATERIALS

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Chemistry in supercritical fluids (SCFs) offers enabling routes to advanced nanostructured materials as an alternative and intermediate approach to wet and dry chemistry. Here I will discuss works from our group on the nucleation and growth of inorganic and hybrid organic/inorganic nanostructures (NPs) in SCFs [1]. I propose to present also our technological breakthrough thanks to the development of microreactors working under supercritical conditions [2]. Supercritical microfluidic can offer several advantages over conventional macroscale chemical processes including hydrodynamics control, enhancement of mass and heat transfer, reproducibility, rapid screening of parameters, low reagent consumption during optimization and *in situ* characterization.

The synthesis of inorganic NPs in SCFs is investigated from the beginning of the 90's and is mainly based on the chemical transformation of metal precursors or salts in SCFs inducing the nucleation and growth of nanostructures. The interesting points of this approach in comparison with wet and dry methods are: i) the versatility in term of the NPs nature (metal, semiconductor, oxide or still nitride), ii) the formation of well crystalline inorganic materials at relatively low temperature (below 400°C), iii) the access to high specific surface area materials and iv) the opportunity for new discoveries knowing that there is still numerous ideas to investigate in this specific place of the phase diagram.

Recent works on continuous supercritical fluids synthesis of nanostructured materials in micro- and millifluidic reactors will be presented; it will mainly concern the development of new efficient materials for application in catalysis [3], optics [4] and microelectronic [5].

References

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