

# FINAL MASTER PROJECT PROPOSAL



## Title

Particle engineering in metal organic framework ZIF-8

## Supervisor(s)

Joaquín Coronas Ceresuela

Instituto de Nanociencia de Aragón/Departamento de Ingeniería Química y Tecnologías del Medio Ambiente. Universidad de Zaragoza. coronas@unizar.es

## Summary of the project

Due to its crystallinity, high microporosity and thermal stability, ZIF-8, based on the combination of imidazolate ligand and Zn metal, is one of the most studied metal organic frameworks (MOFs). It can be applied to different fields such as catalysis, molecular separations by adsorption and membranes, encapsulation for several purposes and electronics, among others. This is the reason because it is important to find new strategies to control not only its particle size (something already done) but also its morphology and aspect ratio.

This work will search for synthesis strategies, based on the use of surfactant molecules, in principle cationic (e.g. CTA+), that allow the control of the synthesis of ZIF-8 as to alter its aspect ratio. Green solvents, based on water and water-ethanol (eventually methanol) mixtures will be used for the synthesis of the MOF. The obtained materials will be characterized by X-ray diffraction, N<sub>2</sub> and CO<sub>2</sub> adsorption, FTIR and Vis-UV spectroscopies, thermogravimetric analysis and scanning and transmission electronic microscopies, among others. Finally, MAUD will be use to analyze the structures achieved.