

DEPARTAMENT DE QUÍMICA FÍSICA 2026-2027			
	DOBLE GRAU DE QUÍMICA-ENGINYERIA QUÍMICA		
NÚMERO	TEMA	TUTOR(S) ACADÈMIC(S) (si un és d'un altre departament, posa'l entre parèntesi)	TUTOR EXTERN (si escau)
1	Engineering Polymeric Supports via Supercritical CO ₂ Processing for Enzyme Immobilization in Biocatalysis	Rafael Muñoz- Espi	
2	Synthesis and Electrochemical Characterization of Sodium-Ion Insertion Materials for Next-Generation Batteries.	Jose Juan García Jareño/ Jerónimo Agrisuelas	

VNIVERSITAT E VALÈNCIA (ò*) Facultat de Química

DEGREE FINAL PROJECT (CHEMISTRY) CHEMISTRY AND CHEMICAL ENGINEERING DOUBLE DEGREE

ACADEMIC TUTOR 1 Rafael Muñoz-Espí

ACADEMIC TUTOR 2

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Química Física

TITLE (Mandatory in English)

Engineering Polymeric Supports via Supercritical CO₂ Processing for Enzyme Immobilization in Biocatalysis

OBJECTIVES / OBJECTIUS / OBJETIVOS: (Choose the language)

- Development of synthesis strategies for the use of supercritical CO₂ as a solvent in heterogeneous phase polymerization processes aimed at preparing enzymatic supports.
- Incorporation of specific enzymes into polymer supports and study of the enzymatic activity.

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

The work focuses on the use of supercritical CO₂ as a sustainable solvent for heterogeneous phase polymerization reactions (i.e., with the monomer dispersed in a continuous phase of supercritical CO₂). The equipment for conducting experiments with supercritical fluids is located in the Department of Chemical Engineering at ETSE.

Polyacrylamide will be used as the initial polymer system, although the application of other polymers may also be evaluated. The optimal conditions for incorporating enzymes (e.g., catalase) into the polymer supports will be studied. Once the materials have been characterized using appropriate analytical techniques (FTIR, swelling studies, thermogravimetric analysis, differential scanning calorimetry, electron microscopy), the activity of the supported enzymes will be evaluated and compared to that of free enzymes.



DEGREE FINAL PROJECT (CHEMISTRY)
CHEMISTRY AND CHEMICAL ENGINEERING DOUBLE DEGREE

ACADEMIC TUTOR 1 José Juan García Jareño

ACADEMIC TUTOR 2 Jerónimo Agrisuelas Vallés

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Química-Física

TITLE (Mandatory in English)

Synthesis and Electrochemical Characterization of Sodium-Ion Insertion Materials for Next-Generation Batteries.

OBJECTIVES / OBJECTIUS / OBJETIVOS: (Choose the language)

Main Objective:

To synthesize, process, and electrochemically evaluate insertion materials (either anode or cathode) for sodium-ion batteries at a laboratory scale, optimizing formulation parameters to achieve high specific capacity and cyclability.

Specific Objectives:

1. Literature Review
2. Material Synthesis
3. Physicochemical Characterization
4. Electrochemical Testing

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

- Phase 1: Bibliographic Search & Material Selection
Phase 2: Synthesis and Electrode Preparation
Phase 3: Structural Characterization
Phase 4: Electrochemical Characterization
Phase 5: Data Integration & Comparative Analysis
Phase 6: TFG Report Writing