DEPARTAMENT DE QUÍMICA ORGÀNICA

NÚMERO	TEMA	TUTOR(S) ACADÈMIC(S) (si un	TUTOR EXTERN (si escau)
11	Evolution of malaria drugs and the significant role of artemisinin	Juan Francisco Sanz Cervera	
13	Synthesis of photoactive esters of the 2-sulfoacetic acid for decarboxylative sulfoalkylation reactions	Gonzalo Blay Llinares	
15	Sustainable synthesis of pyridinediimine ligands and their catalytically active	Salah-Eddine Stiriba	
30	Synthesis of nanoheterostructures based on upconversion nanoparticles	María González Béjar / Julia Pérez Prieto	
32	Photocatalytic [4 + 2] cycloadditions of N,N-dimethylaniline with maleimides mediated with near-infrared-light	Jorge Escorihuela Fuentes	
37	Introducing organocatalysis in undergraduate teaching: design of a practical session for the "Laboratory of Organic Chemistry II"	Amparo Sanz Marco / Jaume Rostoll Berenguer	

Annex 1 (**not to be printed**)

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VNIVERSITAT DE VALÈNCIA Facultat de Química

DEGREE FINAL PROJECT
CHEMISTRY DEGREE

ACADEMIC TUTOR 1 Juan Francisco Sanz Cervera

ACADEMIC TUTOR 2

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Organic Chemistry

TITLE (Mandatory in English)

Evolution of malaria drugs and the significant role of artemisinin

OBJECTVES / OBJECTIUS / OBJETIVOS: (Choose the language)

This TFG aims to study the evolution over the years of the drugs used in the fight against malaria. Additionally, emphasis will be placed on the discovery of artemisinin and related compounds as essential antimalarials nowadays.

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

The student will gather information through a bibliographic search and develop a paper that includes the most relevant aspects of the objectives stated above, all under the guidance and direction of the TFG supervisor.

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DEGREE FINAL PROJECT
CHEMISTRY DEGREE

ACADEMIC TUTOR 1 Gonzalo Blay Llinares

ACADEMIC TUTOR 2

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Química Orgànica

TITLE (Mandatory in English)

Synthesis of photoactive esters of the 2-sulfoacetic acid for decarboxylative sulfoalkylation reactions

OBJECTVES / OBJECTIUS / OBJETIVOS: (Choose the language)

- Development of a synthetic procedure for the preparation of NHPI esters of 2-fluorosulfonyl acetic acid from 2-sulfoacetic acid.

- Preliminary study of the fluorosulfonylalkylation of alkenes under photoredox or electrochemical conditions

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

To achieve the synthesis of the target NHPI ester, sulfoacetic acid will be transformed into its carboxylic acid chloride and treated with N-hydroxyphthalimide. The resulting NHPI ester will be converted into the corresponding fluorosulfone upon treatment with thionyl chloride and KF. Once prepared, the NHPI ester will be used to achieve the introduction of a fluorosulfonylmethyl group into alkenes via a radical pathway under photochemical or electrochemical conditions. The reaction conditions will be optimized to achieve the highest possible yields and the scope of the reaction will be studied.
The student should acquire skills in the following aspects:
Bibliographic search.
Advanced organic chemistry laboratory techniques.
Chromatographic techniques (thin layer and column chromatography)
Structural analysis (NMR, EM, etc.)
Instrumental analysis (HPLC, GC, etc.)

Annex 1 (**not to be printed**)

VNIVERSITAT DE VALÈNCIA Facultat de Química

DEGREE FINAL PROJECT
CHEMISTRY DEGREE

ACADEMIC TUTOR 1 SALAH-EDDINE STIRIBA LAKANI

ACADEMIC TUTOR 2

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Organic Chemistry

TITLE (Mandatory in English)

Sustainable synthesis of pyridinediimine ligands and their catalytically active copper and palladium complexes

OBJECTVES / OBJECTIUS / OBJETIVOS: (Choose the language)

The objectives of this TFG project are as follows:

i) The mechanochemical preparation and physical characterization of pyridinediimine (PDI) ligands.
ii) The mechanochemical and physical characterization of their copper(I)/(II) and palladium(II) complexes.
ii) The study of the catalytic potential of such complexes in the sustainable carbon-carbon and carbon-nitrogen bonds forming reactions in water as solvent.

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

The above objectives will be addressed through the synthesis of C2-symmetric imino-pyridine ligands under mechanochemical conditions.

Their copper and palladium metal complexes will also be prepared under the same conditions.

The C2-symmetry PDI ligands and their complexes will be characterized by FTR, UV-visible, NMR, mass-spectrometry, photoluminescence and X-ray diffraction on single crystals.

Their catalytic properties will be tested on sustainable fashion of the Suzuki and Heck

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DEGREE FINAL PROJECT
CHEMISTRY DEGREE

ACADEMIC TUTOR 1 María González Béjar

ACADEMIC TUTOR 2 Julia Pérez Prieto

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Química Orgánica

TITLE (Mandatory in English)

Synthesis of nanoheterostructures based on upconversion nanoparticles

OBJECTVES / OBJECTIUS / OBJETIVOS: (Choose the language)

Main Objective:
To synthesize nanoheterostructures via cation exchange incorporating upconversion nanoparticles (UCNPs), and to derivatize them with organic ligands and chromophores in order to enhance their optical properties for potential applications in photocatalysis.
Specific Objectives:
- To design, synthesize, and characterize nanoheterostructures based on upconversion nanoparticles (UCNPs).
- To derivatize the synthesized nanostructures with organic ligands and chromophores to tailor their surface chemistry and improve their photocatalytic performance.

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

The project will be carried out in several stages, combining wet-chemical synthesis techniques with advanced characterization methods:

1. Synthesis of upconversion nanoparticles
2. Nanoheterostructure fabrication and derivatization with organic ligands and chromophores
3. Characterization:
Transmission Electron Microscopy (TEM): For morphology and size distribution.
X-ray Diffraction (XRD): To confirm crystal phase and structural integrity.
Fourier Transform Infrared Spectroscopy (FTIR): To analyze surface functional groups.
Dynamic Light Scattering (DLS): For hydrodynamic size and colloidal stability.
Photoluminescence Spectroscopy: To measure emission spectra and quantum yield.
4. Data Analysis and Interpretation
5. Documentation and Reporting

VNIVERSITAT DE VALÈNCIA Facultat de Química

DEGREE FINAL PROJECT
CHEMISTRY DEGREE

ACADEMIC TUTOR 1 Jorge Escorihuela Fuentes

ACADEMIC TUTOR 2

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Departamento de Química Orgánica

TITLE (Mandatory in English)

Photocatalytic [4 + 2] cycloadditions of N,N-dimethylaniline with maleimides mediated with near-infrared-light

OBJECTVES / OBJECTIUS / OBJETIVOS: (Choose the language)

To develop a photocatalytic method for [4 + 2] cycloaddition reactions between N,N-dimethylaniline and maleimides using near-infrared (NIR) light as the activation source.

To explore the scope and limitations of the cycloaddition reaction by varying the maleimide substituents and electron-donating groups on N,N-dimethylaniline.

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

Phase 1: Literature Review and Planning
Review recent advances in NIR photocatalysis.

Phase 2: Reaction Design and Optimization
To develop a base reaction system and optimize key parameters: photocatalyst loading, solvent, temperature, etc.

Phase 3: Substrate Scope and Mechanistic Studies
To evaluate the reaction scope with different maleimides and N,N-dimethylaniline derivatives.
To investigate the mechanism of the reaction and confirm the nature of intermediates.

Annex 1 (**not to be printed**)

VNIVERSITAT DE VALÈNCIA Facultat de Química

DEGREE FINAL PROJECT
CHEMISTRY DEGREE

ACADEMIC TUTOR 1 Amparo Sanz Marco

ACADEMIC TUTOR 2 Jaume Rostoll Berenguer

EXTERNAL TUTOR (if needed):

DEPARTMENT(S): Organic Chemistry

TITLE (Mandatory in English)

Introducing organocatalysis in undergraduate teaching: design of a practical session for the "Laboratory of Organic Chemistry II"

OBJECTVES / OBJECTIUS / OBJETIVOS: (Choose the language)

1. Identify and select an organocatalytic reaction.

2. Adapt and optimize the reaction.

3. Prepare the laboratory manual.

METHODOLOGY / METODOLOGIA / METODOLOGÍA: (Choose the language)

1. A bibliographic search will be carried out to identify organocatalytic reactions suitable for undergraduate teaching laboratories, considering factors such as reaction time, safety, cost, environmental impact, and pedagogical value.
2. The selected reaction will then be optimized by adjusting parameters such as substrates, organocatalyst, solvent, and temperature, so that it can be completed within a laboratory session. The characterization of the potential product (NMR, IR, optical rotation...) will also be studied.
3. Teaching materials will be prepared, including a theoretical introduction, experimental procedure, and pre- and post-lab questions, to guide students through the experiment