



DOCTORAL RESEARCH TOPIC:

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Bio-derived catalysts from mugwort for hydrogen production and CO<sub>2</sub> reduction: a sustainable approach to renewable energy

RESEARCH FIELD:

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Environmental Engineering (T 004)

BRIEF DESCRIPTION OF RESEARCH TOPIC:

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This research focuses on developing bio-derived catalysts from mugwort (*Artemisia*) for hydrogen production and CO<sub>2</sub> reduction, aiming to contribute to sustainable energy solutions. With the increasing need for renewable energy sources and carbon management technologies, bio-based catalysts offer an eco-friendly alternative to conventional, often rare or toxic, catalytic materials. Mugwort, a readily available and resilient plant, contains unique compounds with promising catalytic properties, positioning it as a potential resource for sustainable catalyst development.

The main goal of the work is to develop and evaluate the economic and environmental effects of bio-derived catalysts derived from mugwort (*Artemisia*) for efficient hydrogen production and CO<sub>2</sub> reduction, contributing to sustainable energy technologies and carbon management.

Objectives:

1. Extract and analyze the chemical composition of mugwort to identify potential catalytic compounds.
2. Develop bio-derived catalysts using mugwort and optimize their structure and properties for hydrogen production and CO<sub>2</sub> reduction.
3. Compare the performance of mugwort-based catalysts with conventional catalysts to determine feasibility and advantages.
4. Evaluate the environmental and economic benefits of using bio-derived catalysts in renewable energy.

SCIENTIFIC SUPERVISOR:

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