

SUSTAINABLE FUTURE STARTS WITH CHEMISTRY

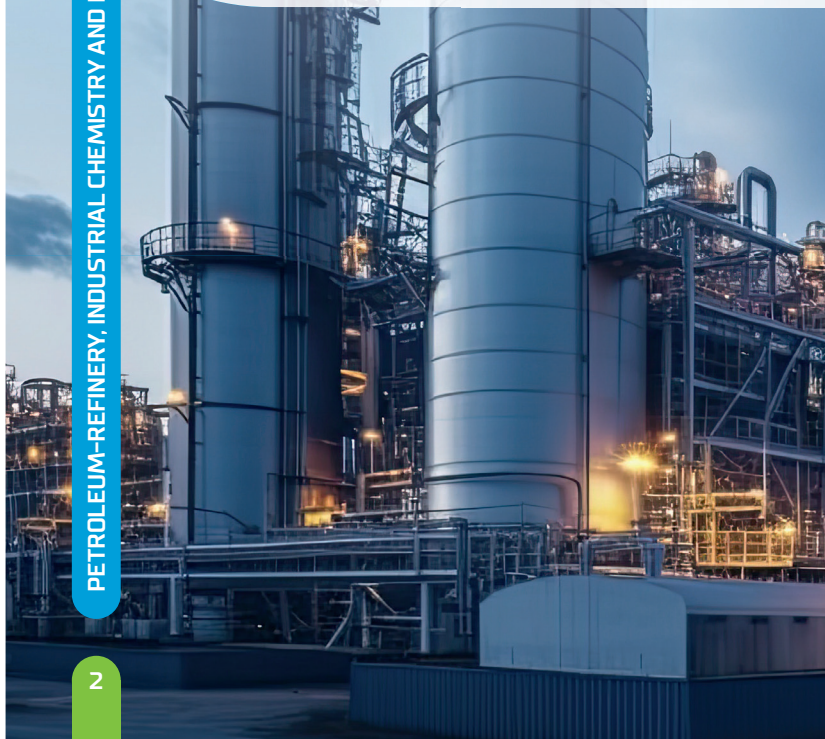
PETROLEUM-REFINERY, INDUSTRIAL CHEMISTRY AND RENEWABLE ENERGY SOURCES



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Institute



PETROLEUM-REFINERY, INDUSTRIAL CHEMISTRY AND RENEWABLE ENERGY SOURCES



**Implementation
of electrocatalytic,
electrochemical and
mechanochemical processes**

in chemical synthesis
and recycling processes

**Development of feedstock
sustainable and low carbon
petrochemical and Circular
Economy processes**

**Modelling and *in silico*
scaling** of chemical processes

RESEARCH OFFER

Implementation of **electrocatalytic, electrochemical and mechanochemical processes** in synthesis and recycling processes

Design of fuel cell components and electrolyzers

Innovative mechanochemical electroactivation techniques for catalytic processes

Hydrometallurgical processes and recycling of elements critical to EU development

Production of basic chemicals

in electrocatalytic processes using waste fractions of biomass origin

Hydrogen production

from contaminated and waste aqueous solutions by electrolysis

Electrochemical sequestration

of greenhouse gases and biomass fractions

Electrochemical technologies

for gas/liquid streams purification and waste minimisation

RESEARCH OFFER

Development of resource-saving and low-emission petrochemical and circular economy processes

Supercritical catalysis processes for emission-sustainable petrochemicals (fuel components, basic chemicals) and plastics (monomers) synthesis

Technologies for purification and minimisation of wastewater and waste from chemical processes and installations

Processes of cryogenic extraction, sorption and membrane separation in the purification of gaseous streams and high-concentration hydrogen streams

Conversion of waste biomass into substitutes for petrochemical intermediates (fuel components, basic chemicals) and into marketable products

Chemical recycling of renewable energy infrastructure components

Hydrogen fuel analysis and industrial analytical laboratory

Elemental carbon recycling technologies conversion chains that close the gaps in waste management up to feedstock quality for the petrochemical industry

Innovative processes for separation and standardisation of liquid and gaseous waste streams and petrochemicals, including ionic liquids and DES usage

Autonomous thermal heat and cold storage systems

Modelling and *in silico* scaling

of chemical processes, testing of industrial catalysts

Use of ChemCAD, Ansys Fluent, ChemKin process simulators for medium-scale process modelling and support for design offices

Scaling-up and piloting (own and industrial partners large laboratory and pilot plants, including hydrogen processes) with reduced carbon footprint, realised using low-carbon energy sources

Own and partner databases of pure substances
partner: UNIFAC Consortium

Downsizing of industrial plants to laboratory and large laboratory scale

Autonomisation of research processes

Testing of commercial catalysts in smaller scale

OUR VALUES

We work with passion, based on:

Professionalism

Commitment

Integrity

Partnership

POTENTIAL

Product and process innovation

from pilot scale to production in our own process halls

Development and competence

investment in technology and human resources with more than 170 scientists and specialists for companies investing in innovation

Research platform

implementation of R&D projects

Process scaling

scale-up and scale-down of chemical processes

Laboratories and equipment

development of research facilities with specialised laboratories and state-of-the-art equipment

Cooperation with leaders

cooperation with Polish and foreign business and academic partners

Completion of technological line distributed on the market

from 'concept to product'

Inventions and know-how

patented solutions and know-how in the field of modern chemical processes that can be commercialised



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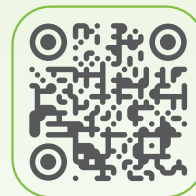
Industrial Chemistry Institute

**We create innovations
that shape a sustainable future.
Trust our knowledge and experience!**

LET'S MEET!

**Łukasiewicz Research Network
Industrial Chemistry Institute**

8 Rydygiera St.
01-793 Warsaw, Poland
ichp.lukasiewicz.gov.pl/en



**Antoni Migdał, PhD. Sc. Eng.
Sustainable Chemistry Center**

+48 517 883 146
antoni.migdal@ichp.lukasiewicz.gov.pl

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