Ilaria Rizzardi

ADDRESS	[redacted]
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AREAS OF INTEREST	Membrane processes, wastewater treatments, sustainable processes, catalysis, chemical processes, reactors

EDUCATIONAL QUALIFICATIONS

2020- present

PhD student

PhD student STC (Scienze e Tecnologie chimiche)

XXXVI cycle

Università degli studi di Genova

Project: Membrane application in wastewater treatment

Research areas:

- Membrane process
- Wastewater treatments
- Biomass
- Sustainable processes
- Process intensification

2017–2020

Master's degree in industrial chemistry

Università degli studi di Genova

Final score: 107/110

Thesis: Dry reforming in rhodium-based catalytic membrane reactors

Research Areas:

- Chemistry and catalysis technology
- Plant and reactors
- Industrial chemistry
- Sustainable process

Abstract:

Dry reforming of methane (MDR) is a process that allows to produce syngas while consuming the two main greenhouse gases (CO_2 and CH_4). In addition, biogas is a renewable feed for this process after pre-treatment. Now, MDR is not fully used in industry mainly due to a problem of deactivating the traditional catalyst. The purpose of the work is to develop an effective catalytic system consisting of a catalytic membrane that could be used in flow through mode. The catalyst obtained is active in the dry reforming reaction. The conversions are less than 30% in a temperature range of 400-500 °C and the carbon formation is low if compared with Nickel traditional catalyst. The H_2/CO ratio is lower than1 due to the presence of side reactions such as mainly reverse water gas shift. In membranes that are characterized by small pore sizes in the selective layer, Knudsen diffusion mechanism occur, and the activity of the catalyst is higher than in others. The structure of the membrane obtained allows to achieve the kinetic regime.

2011–2017 **Bachelor's degree in Chemistry and Chemical Technologies**

Università degli studi di Genova, Genova (Italia)

Final score: 96/110

Internship report: Development of a plant for the evaluation of fuel cells and characterization of electrode membrane assembly (MEA)

Research areas:

- Membranes and catalysts
- Chemical technologies for industry and the environment
- Energy production from renewable sources

Abstract:

Fuel cells are devices that convert the chemical energy of a reaction between a fuel and an oxidant into electrical energy, without heat-work-energy conversion, typical of the usual energy production methods. Cells with a proton exchange polymer membrane (PEM) have the great advantage of being able to work with high temperatures and pressures. Among these in DMFCs (Direct Methanol Fuel Cell) the fuel is methanol, which is oxidized to the

anode in the presence of a catalyst producing electrons and H^+ ions. Protons pass to the cathode through the proton exchange membrane where the reduction takes place. The production of electrons at the anode generates a potential difference between the two electrodes; in this way the fuel cell acts as a direct current generator. The set of membranes and catalytic layers constitute the MEA. During the internship, a plant was set up for the characterization of the performance of methanol-powered fuel cells equipped with a electrode-membrane assembly (MEA)

WORK EXPERIENCE

07/2020-11/2020

Internship with grant

With the membrane & membrane research group

Topic: Characterization of membranes and materials with image analysis and gas and liquid permeation

03/2019-03/2020

Master's thesis

With the membrane & membrane research group

Università degli studi di Genova

Acquired knowledge:

- Good knowledge of catalyst preparation techniques (ion exchange, homogeneous precipitation, wet impregnation, dry impregnation) and characterization
- Experience in the control of the dry reforming process in pilot plant
- Good knowledge of membrane processes
- Good knowledge of inorganic ceramic membranes (morphology, properties, uses, treatments)
- Good knowledge of Gas chromatography
- Good FAAS knowledge
- Good knowledge of some techniques for characterization of porous materials (77K nitrogen physisorption and pure gas permeation)

11/2016–02/2017

Bachelor's degree internship

With membrane&membrane research group,

Università degli Studi di Genova

- Experience in using fuel cells
- Good knowledge of the influence of operational variables on the performance of a fuel cell
- Basic knowledge of Gas chromatography
- Good knowledge of HPLC
- Good knowledge of specific tools for fuel cell testing such as Hydrogen test kit, Methanol test kit and Bubble Humidifier

PERSONAL SKILLS

Native language **Italian**

English

UNDERSTANTING		SPEAKING		WRITING
listening	reading	interaction	speaking	
B2	B2	B2	B2	B2
Certificate: PET				

Technical skills

- Great command of the Windows operating system
- Microsoft Office knowledge (Word, Excell, PowerPoint, Teams)

Driving license B

Processing of personal data Autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae in base all'art. 13 del D. Lgs. 196/2003 e all'art. 13 del Regolamento UE 2016/679 relativo alla protezione delle persone fisiche con riguardo al trattamento dei dati personali.