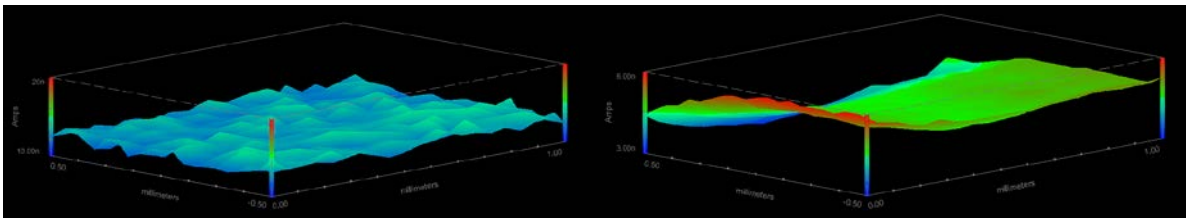
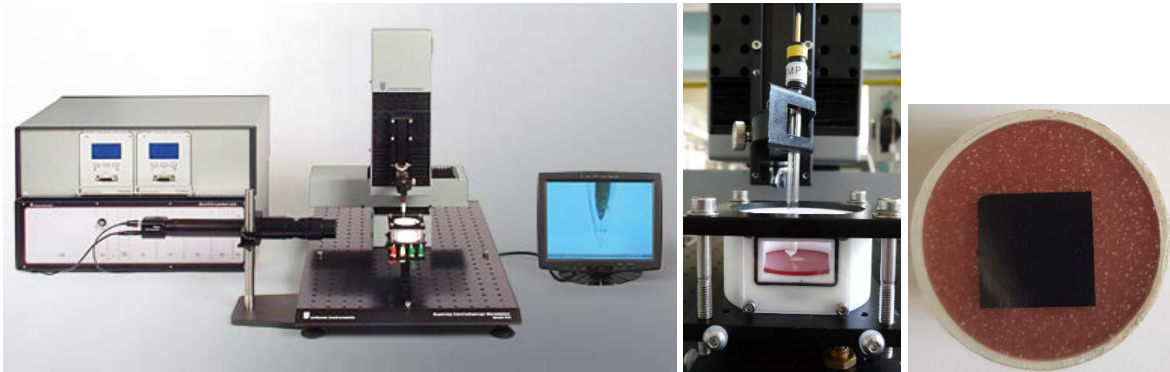
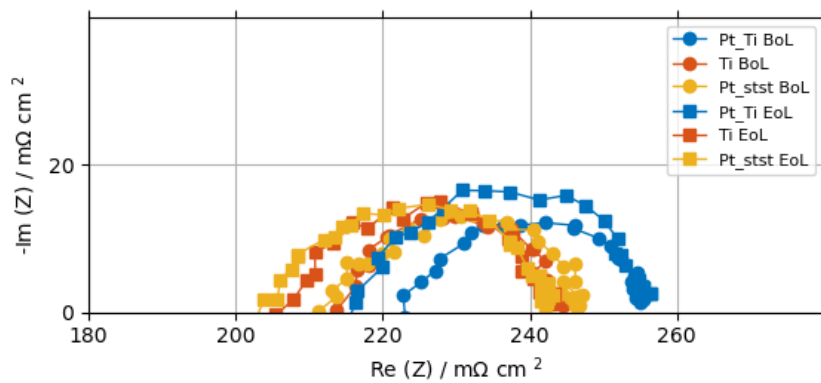
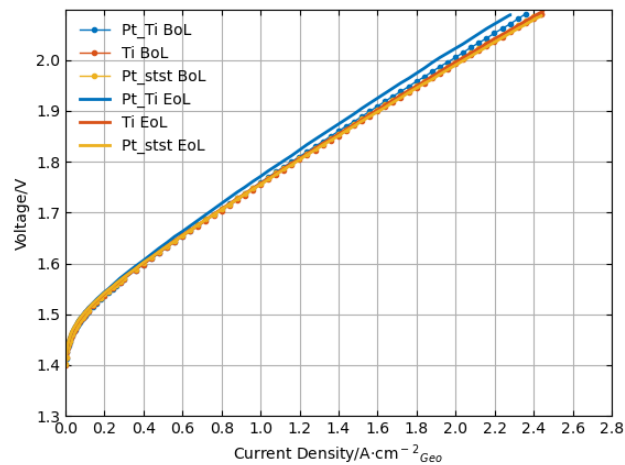


Results 2022



Scanning electrochemical microscopy (SECM) characterization setup in Politehnica University Timisoara and SECM area scan for ferritic stainless steel analysed in the CoDe-PEM project




Galvanostatic experimental results at 70°C for bipolar plates made of Ti, Pt coated Ti and Pt/Ti coated stainless steel




Open day events organized in Politehnica University Timisoara about the CoDe-PEM Project





Monitoring visit of the project from a delegation of the Norwegian Embassy in Bucharest, led by Her Excellency Ambassador Siri Barry.



AISI 442 and 446 Ferritic Stainless Steel as a Support for Bipolar Plates #127 in Proton Exchange Membrane Water Electrolyzers



INTRODUCTION

Proton Exchange Membrane Water Electrolyzers (PEMWE) are widely used to make hydrogen gas from renewable energy. As the demand for hydrogen as a fuel grows, lower cost membranes are needed. The CoDe-PEM project is a collaborative effort of several European countries to develop a new generation of PEMWE membranes. The aim of this project is to develop a new generation of PEMWE membranes that are more resistant to oxidative stress and have a higher proton conductivity. The aim of this project is to develop a new generation of PEMWE membranes that are more resistant to oxidative stress and have a higher proton conductivity.

MATERIALS AND METHODS

The electrochemical properties of the AISI 442 and 446 were investigated in 0.1 M H₂SO₄ solution. The electrochemical impedance spectroscopy (EIS) was used to study the electrochemical properties of the AISI 442 and 446. The electrochemical impedance spectroscopy (EIS) was used to study the electrochemical properties of the AISI 442 and 446.

RESULTS AND DISCUSSION

AISI 442 microstructure shows the phenomenon of segregation of ferrite grains on the surface area of the substrate and the development of intermetallic compound phases. The microstructure of AISI 442 shows the presence of ferrite grains on the surface area of the substrate and the development of intermetallic compound phases. The microstructure of AISI 442 shows the presence of ferrite grains on the surface area of the substrate and the development of intermetallic compound phases.

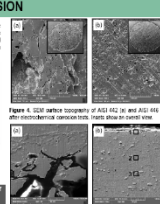


Figure 4. SEM surface topography of AISI 442 (a) and AISI 446 (b) after electrochemical activation in 0.1 M H₂SO₄.

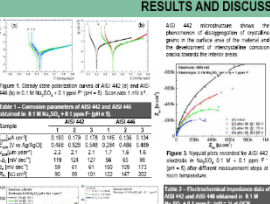


Figure 5. Nyquist plots recorded for AISI 442 (a) and AISI 446 (b) in 0.1 M H₂SO₄ at 100 mV s⁻¹ after electrochemical activation in 0.1 M H₂SO₄.

Sample	R _{ct} (Ω)	W _{ct} (s)	W _{dl} (s)
AISI 442	0.505	0.778	0.142
AISI 446	0.585	0.748	0.148

Table 1. Electrochemical parameters of AISI 442 and AISI 446 in 0.1 M H₂SO₄ at 100 mV s⁻¹.

OBJECTIVES




The work presents the results obtained in the study of electrochemical activation of ferritic steels AISI 442 and AISI 446 with the objective of using them as substrate for the PEMWE. The aim of this work is to study the electrochemical properties of the AISI 442 and 446. The aim of this work is to study the electrochemical properties of the AISI 442 and 446.



CONCLUSIONS


The electrochemical properties of AISI 442 and AISI 446 were investigated in 0.1 M H₂SO₄ solution. The electrochemical impedance spectroscopy (EIS) was used to study the electrochemical properties of the AISI 442 and 446. The electrochemical impedance spectroscopy (EIS) was used to study the electrochemical properties of the AISI 442 and 446.

ACKNOWLEDGEMENT

The research leading to these results has received funding from the European Union Horizon 2020 research and innovation programme under the Marie Skłodowska Curie Grant Agreement No. 101019719.



Project results presented at the WHEC Conference – June 2022, Istanbul