Mid-Term Review 2022
@Budapest, Hungary

"Production and characterization of novel CO_2 reduction electrocatalysts based on bimetallic deposited clusters"

ESR 8- Dimitra Papamichail

Promoter: Prof. Peter Lievens
Co-promoter: Dr. Didier Grandjean

22/04/2022

CV in short

- BSc's studies in Chemistry, Aristotle University of Thessaloniki (AUTH), Greece

- MSc's studies in "Electrochemical Systems: Science and Technology", AUTH, Greece
  - Electrochemistry trainee at Uppsala University, Sweden (3 months)

  - Mainly worked with conducting polymers for corrosion protection.

- Experience in Electrochemistry + materials characterization techniques

HAPPINESS IS
...hanging off a silk.
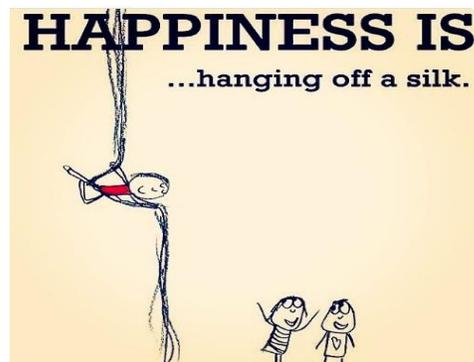
WP1: Magnetron sputtering cluster setup (MSCS) at KUL

Top-view schematic of MSCS
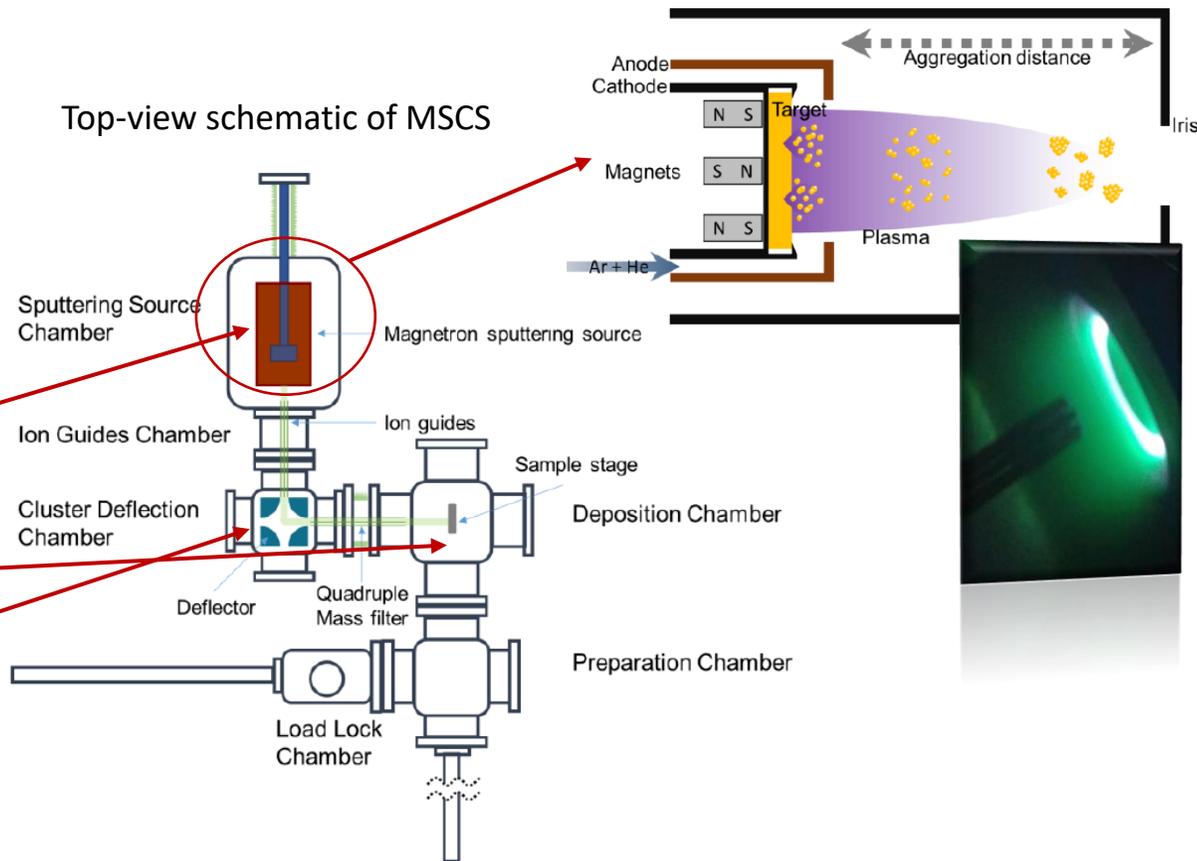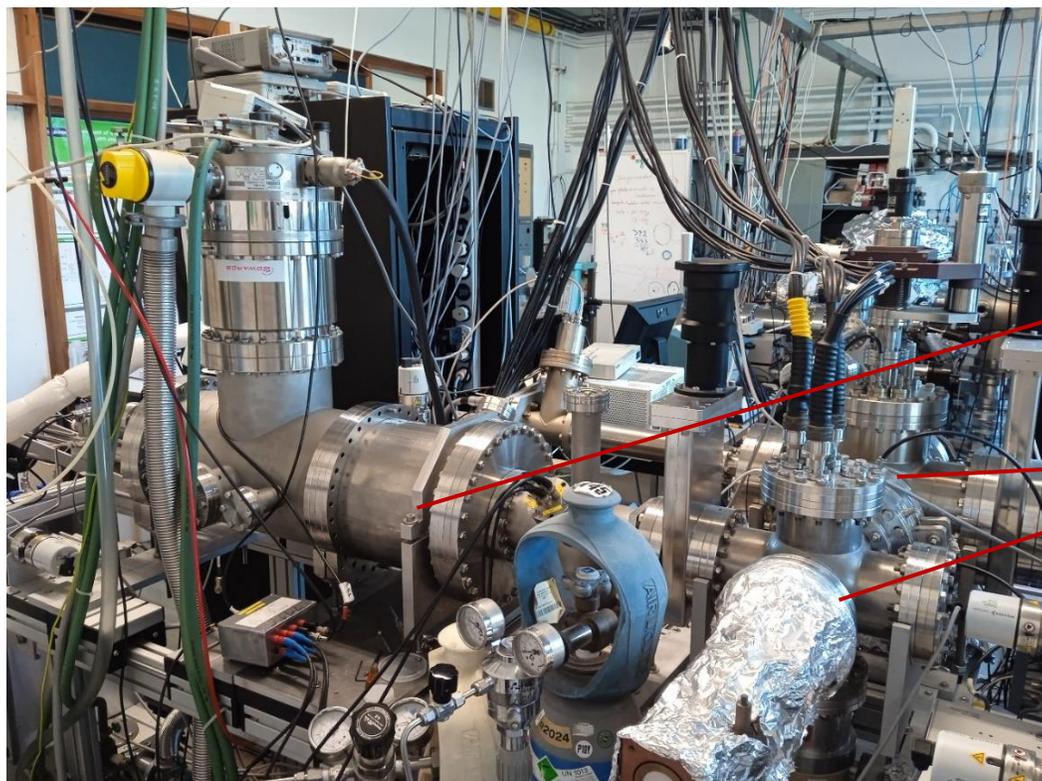
Goal: Calibration of the system using gold (Au) -> D1.1.

Calibration of MSCS

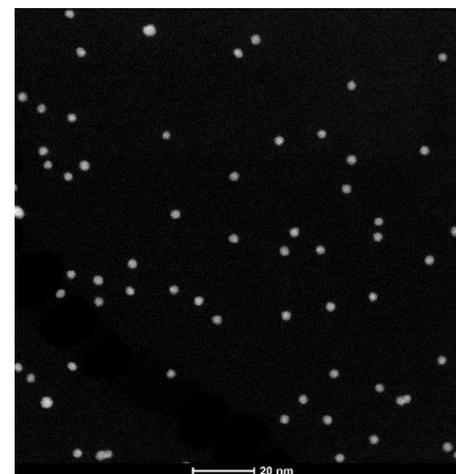| Mass-selection Mode	Figure	Size
Quadrupole mass filter		1-100 atoms
Ion Deflector/ Bender		2-3 nm

Au NCs deposited onto TEM grids: #Deema Balalta (ESR 10@UA) -> WP2 , *D2.3*
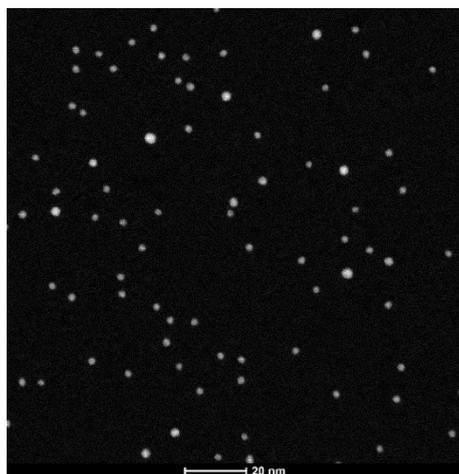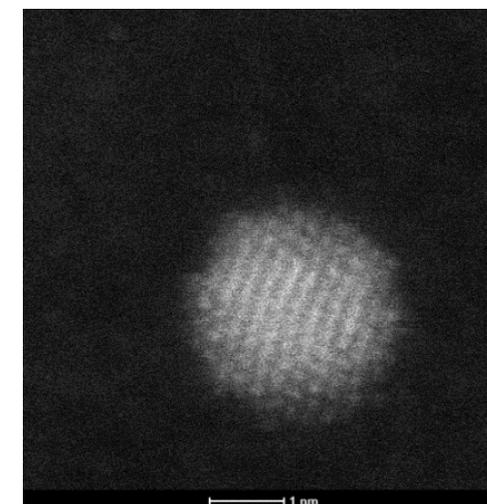

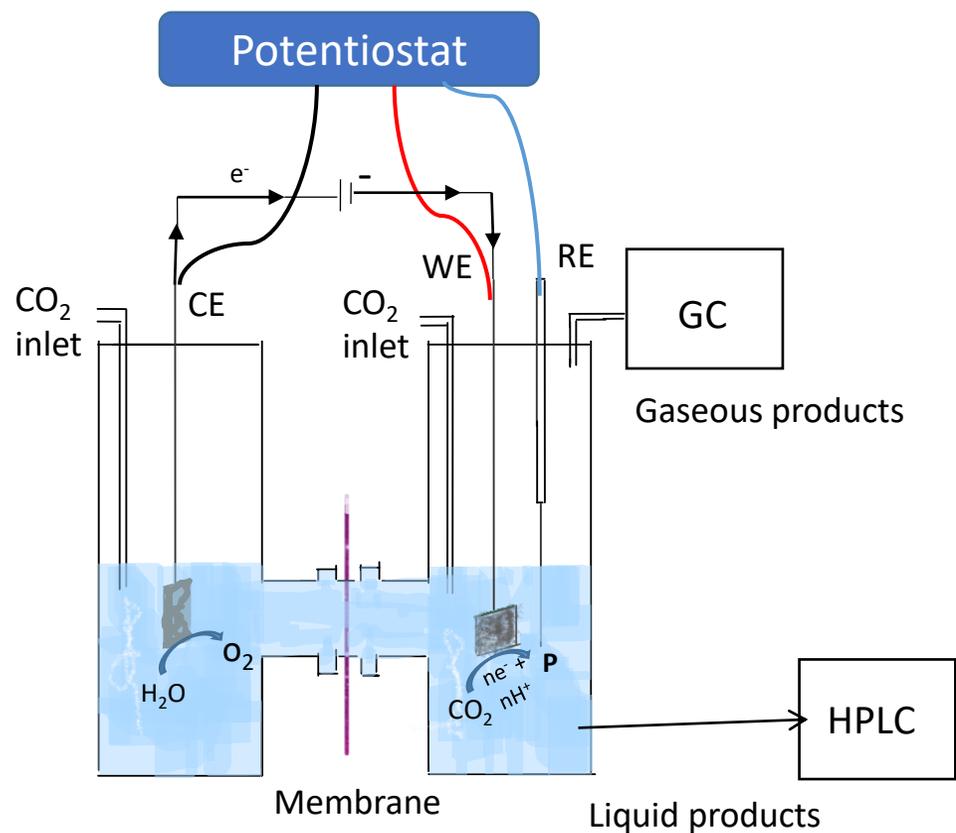Sample 1- 10 V
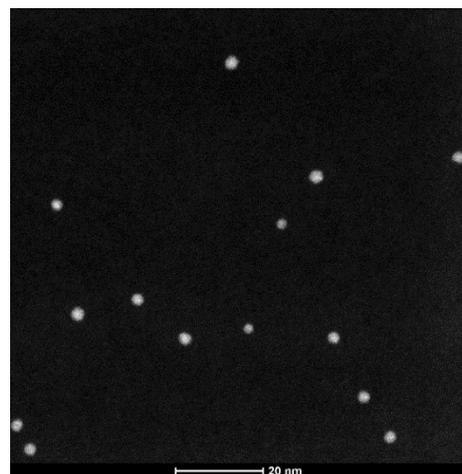
Sample 2 - 15 V

Sample 3 – 20 V

✓ Clusters with **size >1nm**

WP5: Electrocatalytic activity testing of cluster-decorated electrodes

Secondment to VITO -> D5.2:

1. Electrocatalytic activity /selectivity
2. Quantification of products
3. Optimization of electrocatalysis => switch to industrial flow cells -> D5.3

Activities completed until today

Training	Outreach	Conferences	Secondments

Training

- Magnetron sputtering setup

- COMSOL

- XPS (WP2)

- Teaching Assistant Training (ADS)

- Preparation and submission of XAS beamtime proposal (D2.2)

Outreach

o Limitations due to covid19

o Submission of a mini-project in the framework of a course in KUL

Conferences

o *Nano Alloys* Workshop in Paris (postponed to 12/22)

- Webinars on Magnetron sputtering and catalysis

Secondments

- VITO NV
  Within short visits
  - D5.2, D5.3

o PSI
2 visits:
-2022
-2023

o BME (2023)
WP3

- Completed
o Pending

Future Activities

Tasks	J	F	M	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	2023
Training: Manage your PhD (ADS)				●									
Cluster production:					●●●●●●●●●●●●●●●●●●●●●●●●●●●								
ESR 10					●		●						
ESR 12							●						
Electrocatalytic activity testing:									●●●●●●●●●●●●●●				
Ag, Zn onto Glassy Carbon (GC)					●		●						
ZnAg onto GC (D1.1, D5.2)							●		●	●	●		
9-month Presentation (ADS)						◆							
Secondment at PSI						●●●●							
Microdoc (D7.5)							●						
Surfcat Summer School (DTU)								◆					
Academic Writing (ADS) (D7.6)										●●●●●●			
School Visit (OA9)											●		

Thank you for your attention!