

Falling Walls Lab AIMST (Malaysia) 2019

Dr Maisara Shahrom binti Raja Shahrom

Universiti Teknologi PETRONAS

**'Breaking the Wall of CO₂ Capture in
Greenhouse Gases'**



**FALLING
WALLS
LAB**

You delivered the winning performance at the Falling Walls Lab competition at AIMST in Malaysia? What is your innovative idea?



The idea is actually an alternative way in capturing carbon dioxide (CO₂) in greenhouse gases. CO₂ is the primary gas of greenhouse gases that drives the global warming and climate change which continue

to rise every year. This has caused snowmelts, the rising of sea level, severe drought, extreme weather events and others. The current technology in capturing CO₂ in industry is by using amine but it suffers several drawbacks such as it has high vapor pressure, corrosive and it requires high energy input for regeneration. Hence, a new solvent to replace this usage of amine is highly needed. A green salt called ionic liquids (ILs) has been proposed as a new alternative in capturing CO₂. ILs is a salt in liquid form which compose entirely of cation and anion which can be changed independently regarding the properties that we want. In my research, we used amino acid as anion since it has amine functionality. Amine has high reactivity with CO₂ which would then increase the CO₂ absorption. But some of these ILs suffer the problem of having high viscosity which makes handling difficult. By polymerizing these ILs which is known as Amino Acid Polymerized Ionic Liquids (AAPILs), these ILs turn to solid form which eases the handling. The CO₂ adsorption capacity for AAPILs is also higher, almost double than other ILs and amine. These AAPILs also can be recycled more than 5 times with the efficiency of 90% sorption capacity in 5th sorption cycle. Now, this is the perfect candidate in capturing CO₂ to replace the usage of amine and would be beneficial to the industry and to the environment.

Why should people pay attention to your research project?

Carbon dioxide (CO₂) is the main of greenhouse gas, responsible for about three-quarters of emissions. It can linger in the atmosphere for thousands of years. Mitigating this climate impact has been put in Goal 13 in United Nation Sustainable Development Goals. Sustainable Development Goal 13 (SDG 13) aims to take urgent action to reduce climate change and its impact. Hence, this project is important to tackle the issues on climate action that nowadays seems more worrying.

How did you win over the audience?

In order to win the audience, the content should be relatable and easy to understand even for the non-experts. The words that you use in your presentation also should not be a jargon to the audience. Bare in minds that the audience may be someone in the non-experts hence it is good to use words that simple and easy to understand. The presentation also plays an important thing where you need to capture the attention of juries and audience. It must be something that fresh and different from others.

You will be representing Malaysia in the global Falling Walls Lab Finals in Berlin this November? How are you preparing for the event?

I have to polish on my presentation skills. During Falling Walls Lab AIMST, my presentation was not the best and it was not catchy and memorable. I need to work out on how to give an impact to juries and audience. I also need to practice on my presentation timing since I only have 2.30 mins to finish not even 2.31 mins. So, the timing also is the main important thing to do. So, I need to practise! Practise! Practise!

You are also the winner of the EURAXESS Prize 2019 to visit a research lab anywhere in the EU. What are your plans?

Thank you EURAXESS for giving a prize with EUR 600. This is indeed a good opportunity for me to visit any research lab in EU. From the visit, we can learn their research works, research areas and how they managed their research lab so that we can improve ours. A potential collaboration also would be expected to have probably a joint venture, student attachment or research collaboration.

What are you most looking forward to?

The awareness of science communication among students, researchers and academicians is still in unsatisfying level. It is important to develop the interest among Malaysian scientist to deliver their research outcomes to public. This is also important to boost their confidence to speak about science, to educate and to attract audiences' interest in science and technology. Hence, I would like to see that there would be more of science communication platform for Malaysian scientist to present their research outcome in the most of attractive ways. This is also would challenge them to try something new out from their comfort zone. This kind of competition is good to polish their communication skills rather than just sit and do their routine research lab works and published papers for just theirs' KPI (Key Performance Index). Just go and challenge yourself and just enter whatever science competition that can challenge you and make you growth. At the end of the day, it is not about winning, it is about experience that you get. And this kind of great experience you will not get if you stop trying!

Where do you see yourself in 10 years in terms of your research career?

In the next 10 years, I can see myself as academicians who are active in doing research and also a motivator to motivate young scholars to improve their communication skills, to challenge them and to spark students' interest in joining science competition, exhibition and innovation challenge. For my research career, I hope I will contribute on providing more awards and grants in research and development to my university by doing a collaboration with national and international universities. I hope that my research outcomes would contribute in globalised and knowledge-based economy to the society and to the country, Malaysia.

Thank you and good luck!