Research Trip Summary Report

Task 2. Foreign mobility of WUST doctoral students

I. Data of the doctoral student

1.Full name: Vishwajeet

2.Year of studies: 2nd year

3. Educational discipline: Environmental, mining and energy engineering

II. Foreign research trip (research visit)

1. Research institute in which the foreign research was implemented: Chemical and biological Department of Aarhus University

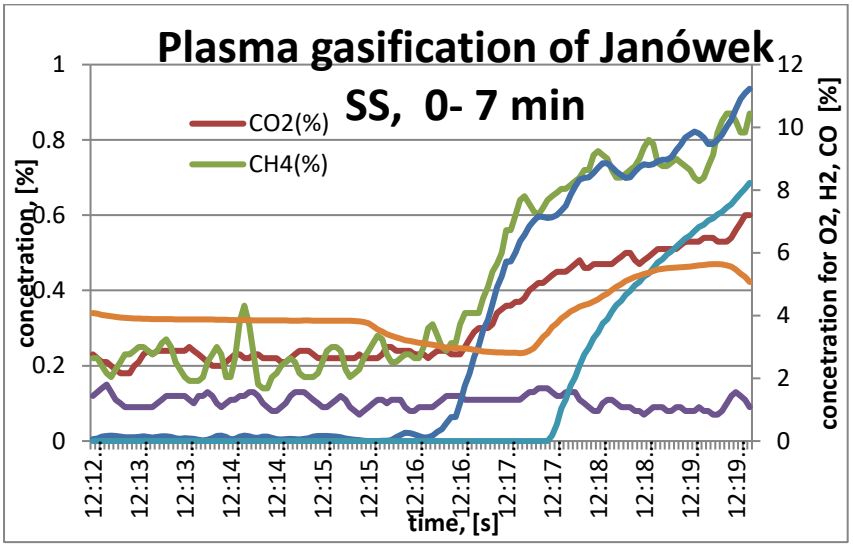
2. Name and surname of the host person (mentor): Assistant Prof. Aidan Mark Smith

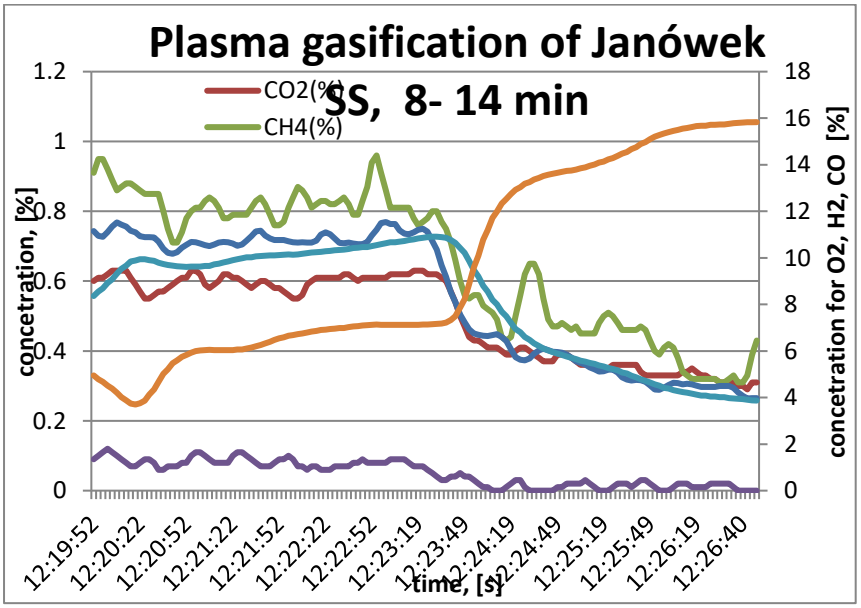
3. Dates of the research trip: 1st February – 30th April 2023

4. Title of a seminar delivered during the research trip: Hydrothermal Carbonization and Plasma Gasification of Sewage Sludge

5. Description of work carried out and the main results during the research trip:

During the research visit, I did Hydrothermal Carbonization (HTC) of Sewage Sludge at different temperatures. I took three types of sewage sludge in which moistures are different in all. Then at 180, 200, 250 and 300-degree temperatures with five minutes and one hour residence time. I did HTC. After HTC I collected the sample and dewatered it and put it in the oven to dry or release the moisture. After that I did C, H,N,S. so that I got the value of carbon, nitrogen, sulfur and hydrogen. After analysis of C,H, N,S I found the carbon content at 300-degree primary sewage sludge is maximum. For plasma gasification, it should be beneficial. I did also HTC of Yanowek sewage sludge which I carried with me from Poland. I found after C,H,N,S. it is also beneficial for plasma gasification. Now in the next step, I did Plasma gasification of these samples. Here I will present only the Yanowek Sewage sludge plasma gasification graph. This experiment went for 14 minutes. First seven-minute run very well but after seven minutes due to leakage the oxygen content becomes increased. Here I am presenting the graph. To present all data and graphs here is impossible so here only I present a few. The rest of I will show in the seminar.





Conclusion- HTC of Primary sewage sludge at 300 degree with one hour residence time have a high carbon content.

6. Future collaborations (if applicable):

This visit is an excellent starting point for potential future collaboration, Scientific research collaborations between Prof. Aidan research group and WUST researchers and students, which is in line with the goals of the NAWA STER program, could also be possible.

7. Title and date of a seminar presenting the results of the trip delivered at Wroclaw University of Science and Technology after returning from the research trip: “Hydrothermal Carbonization of Sewage Sludge at different temperature and Plasma Gasification”, 26.05.2023 at 9.00 am.

III. Doctoral student's signature

…….. (Date)

……..... (doctoral student's signature)

IV. Confirmation and information from the host

1. Confirmation of compliance of the information contained in the report: I CONFIRM / ~~DO NOT CONFIRM~~. (*In justified cases, the confirmation of the host may be sent by e-mail to the Dean's Office of the Doctoral School email: interdocschool@pwr.edu.pl)*

2. Additional information and comments

Vishwajeet did a good job during his stay. He was easily integrated into the research group and learned the techniques relatively fast. Vishwajeet contributed significantly to the research work he was involved in, and we are expecting that this will result in a publication in the near future.

…… (Date)

…..…… (signature of Host Supervisor)