

CASE STUDY

Catalytic pyrolysis of acid pre-treated biomass



Elif Yaman of Bilecik Şeyh Edebali University in Turkey visited CETH / CPERI in Greece through the BRISK initiative.

Here she summarises her time spent at the laboratories in Thessaloniki.

I am a PhD student at the Chemical Engineering Department of Bilecik Şeyh Edebali University, Turkey. When I heard about the BRISK initiative during the 21st European Biomass Conference and Exhibition in Copenhagen, Denmark, I looked on the BRISK website home page to find a host organisation. I decided to apply for a visit to the laboratories of the Centre for Research & Technology Hellas (CETH) / Chemical Process and Energy Resources Institute (CPERI) Thessaloniki in Greece. I thought that a visit to these laboratories would be a good opportunity to contribute to my PhD study. As my PhD research involves catalyst preparation and characterisation, catalytic upgrading of pyrolysis vapour and characterisation of pyrolysis products, BRISK partner CETH seemed to have the best type of equipment to suit my research needs.

The application process was very simple and

uncomplicated. Initially I contacted Dr Panopoulos, then Dr Iliopoulou guided me through the application process. We clarified the experimental procedure, chose the best dates for the visit, and then submitted the application form. The application process concluded within three months.

During my visit to CETH, the catalytic pyrolysis of acid pre-treated biomass was carried out by using different catalysts at the CPERI laboratories. The facility and safety information about laboratories was explained by the technical staff before commencing the experiments. The experimental campaign was supervised by Dr Kalogiannis. Firstly, catalysts were prepared and characterised at the CPERI laboratories. The catalytic pyrolysis experiments were performed at 500°C using a bench scale fixed bed tubular reactor made of stainless steel 316 (diameter 1.4cm, height 36cm) and heated by a three-zone furnace. The detailed schematic diagram of the experimental set-up is shown in Figure 3.

As a young researcher, I was very pleased to be at CETH. It was definitely a beneficial experience, both academically and personally. It was also invaluable to work with other groups, share knowledge and live in a foreign country for a while. I was also delighted to be at Thessaloniki, which is the second-largest city in Greece and the capital of Greek Macedonia. The city is fascinating with its history, monuments and beautiful coast.

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Figure 1: *Left to right*: Biomass used for experiments, catalysts used during the pyrolysis experiments, Elif with members of CETH.

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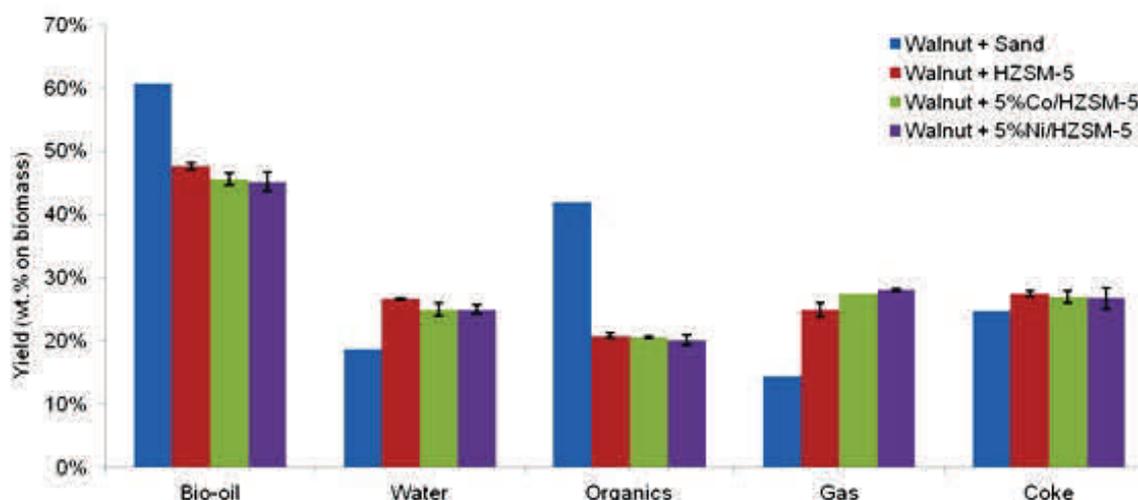
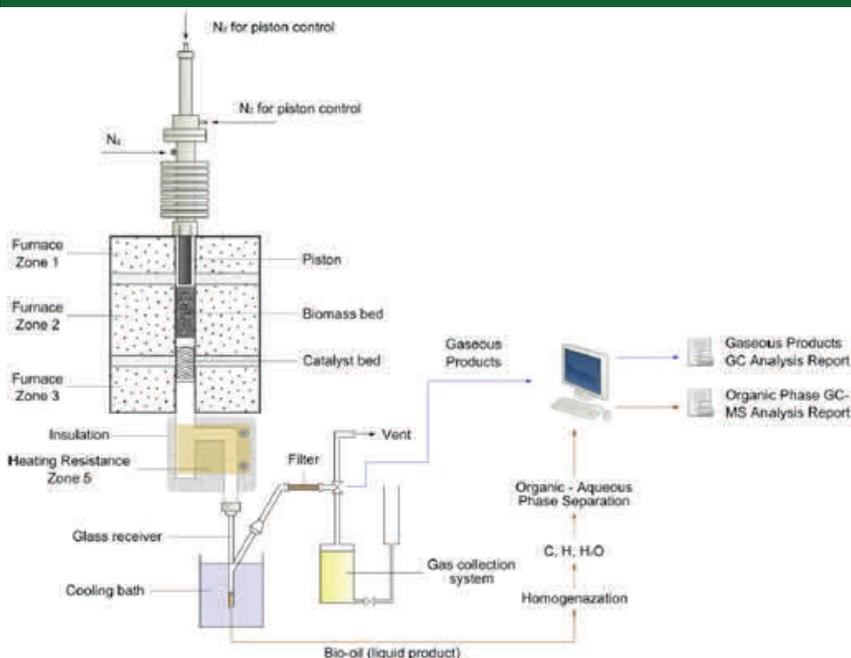


Figure 2: Product yields in non-catalytic and catalytic pyrolysis of biomass.

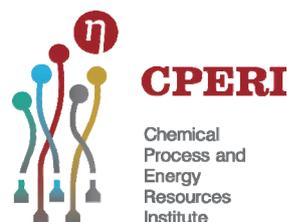


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I also would like to thank my PhD supervisor Dr Basak Burcu Uzun at Anadolu University, Turkey for her support during the application process.

Figure 3: A schematic diagram of the bench scale fixed bed tubular reactor.



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