Living Lab Biobased Brazil
Education Research Innovation

Start- end date: **09/19 – 01/20**	UFV Universidade Federal de Viçosa avans hogeschool	PUC Minas
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Course in the Netherlands: **Chemical Engineering**		
Internship Department/Company: **Centre of Expertise Biobased Economy**		
Brazilian Professor/Supervisor: **Antonio Marcos Siqueira and Leonardo Mitre**		
Dutch Professor/Supervisor: **Michiel Michels and Ischa Lamot**		
Internship: **PHA project**		

Problem / assignment

PHA is a bioplastic that can be produced by PHA accumulating bacteria. Streams that contain volatile fatty acids (VFAs) or carbohydrates can be used as feed for a mixed culture of bacteria (from secondary sludge). These bacteria are capable of converting these VFAs or carbohydrates to the bioplastic PHA.

Used methods / project phases

The aim of this project was to optimize the green extraction of PHA from secondary sludge. This research was based on a four steps process: enrichment, accumulation, extraction and analyses. PHA obtained from extraction was analyzed on its monomer composition with GC-MS and tested on its thermal stability using TGA.

Results

The content of PHA inside the biomass could be increased from 30% to 50%. It was also found out that the enrichment phase is important to modify the color of the biomass, which becomes lighter, and the aspects of the final plastic as well. The extraction of the PHA from the biomass is performed with an environmentally friendly solvent, using a reflux process. Afterwards, the remaining solvent is evaporated to obtain a usable bioplastic.

Extra info / advice / link to final document and presentation

The final report can be accessed at: https://drive.google.com/file/d/12DgeV8nTBuoaY26YEpZ5j5-VeXGAXX2_/view?usp=sharing