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Evaluation of a near-infrared sorting system for bio-based and biodegradable plastics

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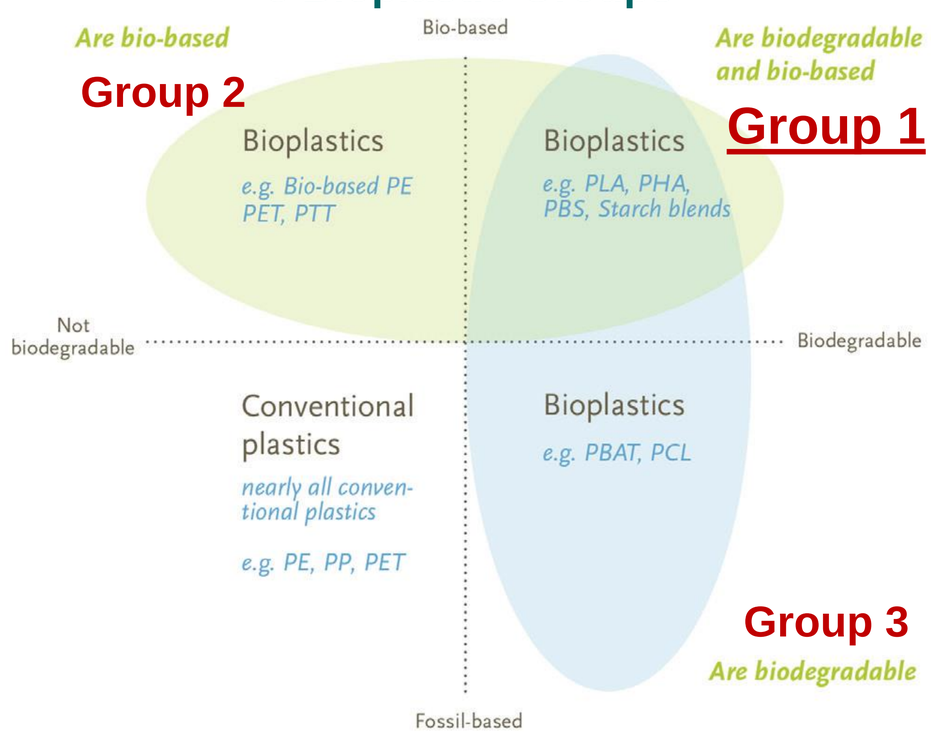
Summary:

- **ESR 7** of Circular Plastics Network for Training (**C-PlaNeT**) project.
- Research is focused on **improving capture of Group 1 bioplastics via waste collection and sorting**.

Introduction:

- Near-infrared (**NIR**) spectroscopy technology **vastly used in waste sorting**[4,6]**.**
- Bioplastics market share **increasing gradually**[1,2,3].
- Currently, **Group 1** bioplastics are **incinerated**[1,3,5].
- No present research on sorting of PHB using NIR sorter.
- ***Research Question****: Whether the NIR spectrum of polyhydroxybutyrate (PHB) coincide with the spectra of polylactic acid (PLA) and the 6 selected conventional plastics, and whether they could be sorted out from the mixed plastic fraction?*

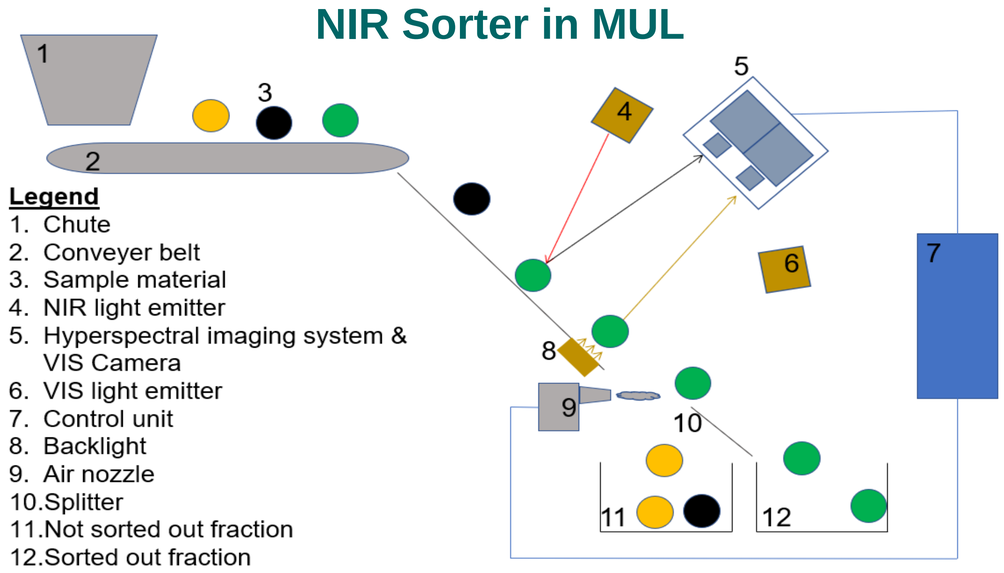
3 Bioplastic Groups



Source: European Bioplastics

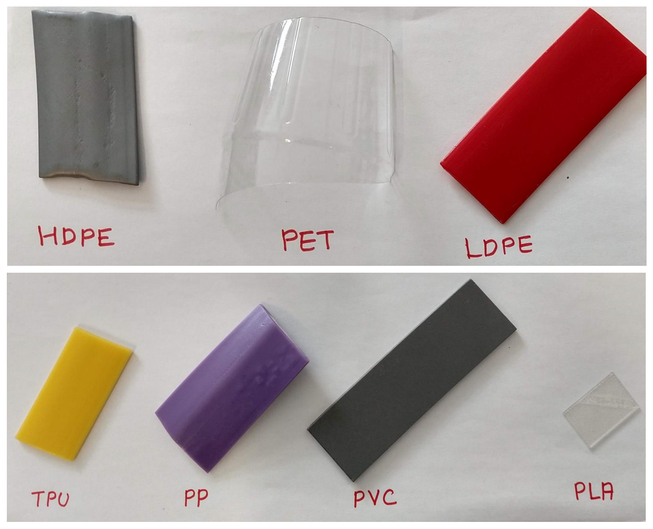
Equipment used:

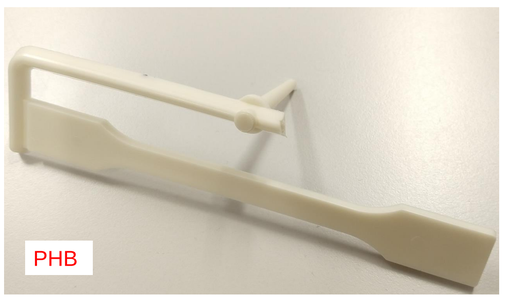
NIR Sorter in MUL



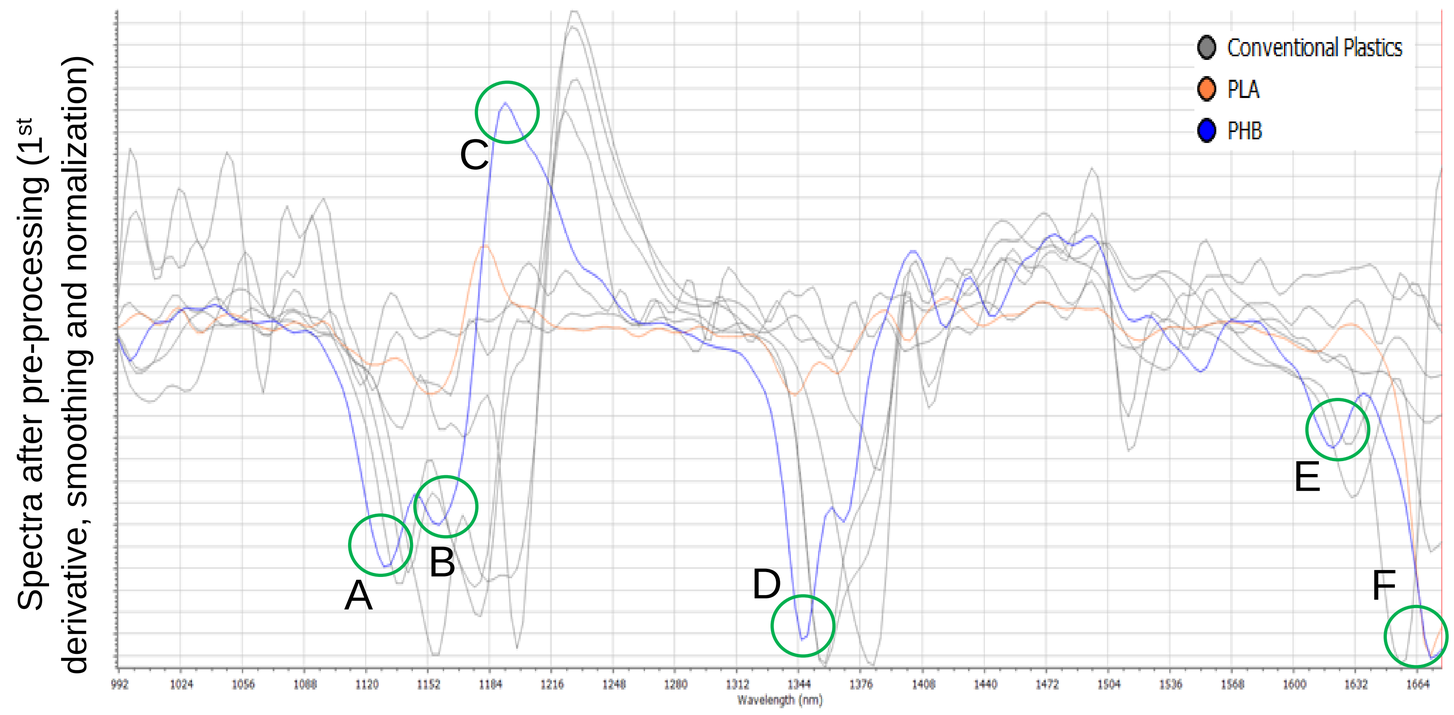
Legend
1. Chute
2. Conveyer belt
3. Sample material
4. NIR light emitter
5. Hyperspectral imaging system & VIS Camera
6. VIS light emitter
7. Control unit
8. Backlight
9. Air nozzle
10. Splitter
11. Not sorted out fraction
12. Sorted out fraction

Samples used:





Results:



Conclusion:

- PHB has a **distinct spectra & was sorted out** from mixed plastic fraction for all the **10 trials**.
- Present research contributes to the field of **Group 1 bioplastics waste management** through **NIR sensor-based sorting**.

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