

19 – 20 FEBRUARY 2026

**VAN DER VALK
AIRPORTHOTEL
DÜSSELDORF –
GERMANY**



**SUCCESSFUL R&I
IN EUROPE 2026
13th EUROPEAN
NETWORKING EVENT**

Call Topic: [HORIZON-CL6-2026-01-CIRCBIO-02](#) Advancing recycling technologies for mixed post-consumer textiles waste from blended products

Project Idea: Scale-up of Polycotton Textile Waste Valorization toward EU Innovation Action

Presenter : Prof. Yusuf Z. Menceloglu
Organization: Sabancı University, Türkiye

Objectives & Expected Results

- **TRL 6–7 demonstration** of a scalable **chemical recycling route** for post-consumer **polycotton textiles**.
- **Effective separation and valorisation** of blended fibres, enabling **fibre-to-fibre recycling** of PET.
- Recovered cellulose converted into melt-processable **biodegradable polymers** for **packaging films** and **rigid non-food packaging**.
- **Market-relevant industrial processing**, compatible with semi-continuous and continuous operation.
- **High-quality secondary materials** with reduced CO₂ emissions, fossil feedstock use, hazardous chemicals and microplastics.
- **Defined recyclability limits and cascading use pathways**, applying **Safe and Sustainable by Design (SSbD)** principles.



Sabancı University's Contribution as a Partner

- **Core technology provider** for chemical recycling of post-consumer polycotton textiles.
- **Lead development and scale-up** of fibre separation and cellulose graft polymerisation processes.
- **Material design & characterisation** of melt-processable, biodegradable polymers for packaging films and rigid products.
- **Industrial integration support**, ensuring compatibility with extrusion and injection moulding.
- **Contribution to SSbD, recyclability limits and cascading use logic**, in collaboration with LCA and industrial partners.

Cotton&Polyester
Blended Fabric Waste

Glycolysis at
high
temperature
w catalyst

Up-Cycling

Converted into
grafted Cellulose

Polyester Polyol

Use Case

Melt
processable
Plastic for
injection
moldable parts

Post
polymerization
and fiber spinning
for textile prod.

Upcycling of polycotton by mechanochemical method

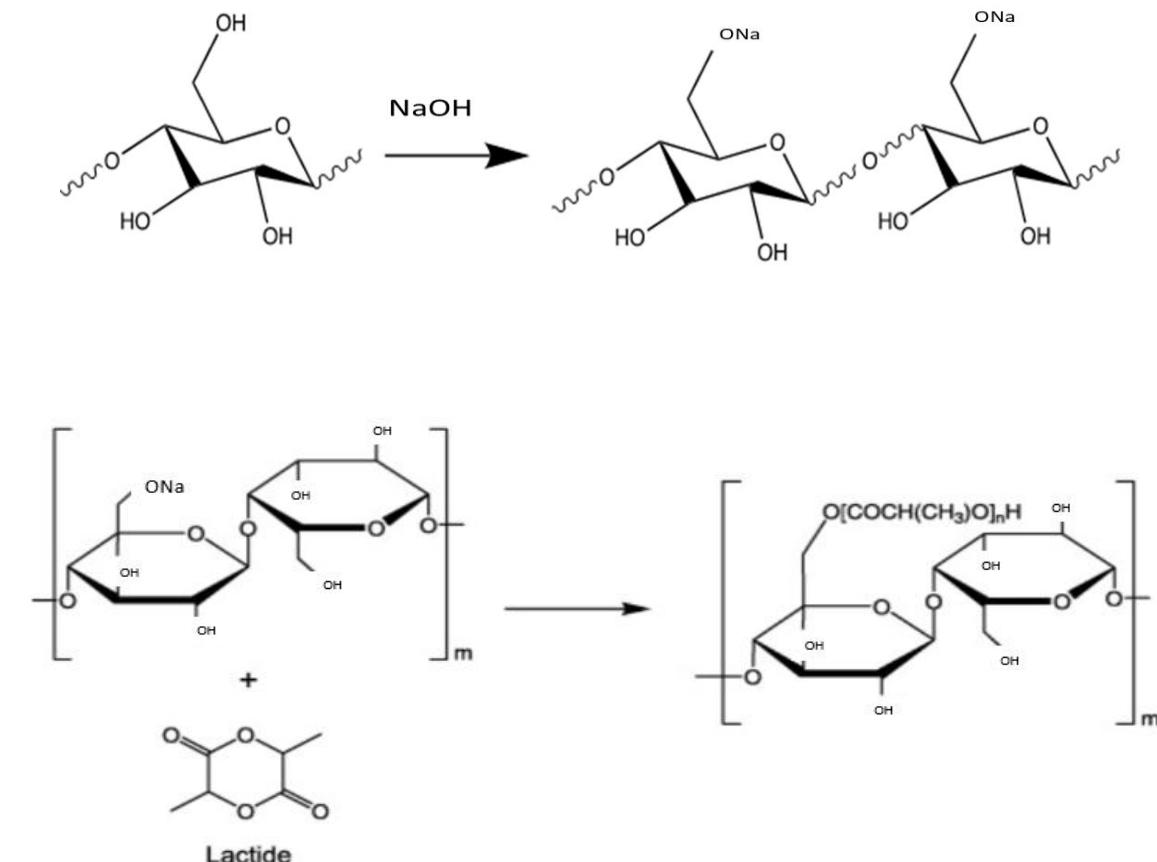
Glycolysis of Cotton & Polyester Blended Fabric Waste
and separate cellulose and polyester polyol

Separated alkyl cellulose will be grafted by ring-opening
polymerization of cyclic monomers to obtain melt
processable biodegradable plastic

Separated polyol will be post polymerized for fiber
spinning

Prepared biodegradable cellulose graft copolymers will
be converted to single use packaging by melt process

Cellulose-g-polylactic acid polymer synthesis



Partners Sought

(as partners/coordinators)

Partner Type	Role
Textile Waste Collectors & Sorters	<ul style="list-style-type: none">Post-consumer waste supplySorting & pre-processingFeedstock characterisation
Chemical Recycling / Process Engineering Companies	<ul style="list-style-type: none">Scale-up of glycolysis / separationReactor designContinuous processing
Textile Fibre Producers / Spinners	<ul style="list-style-type: none">Validate PET-derived fibresFibre-to-fibre demonstrationTextile performance testing
Plastics & Packaging Manufacturers (End-Users)	<ul style="list-style-type: none">Injection mouldingPackaging validationMarket requirementsCertification input
Chemical Safety / PFAS Specialists	<ul style="list-style-type: none">PFAS detection & removalRegulatory complianceToxicological assessment
LCA / LCC / PEF Specialists	<ul style="list-style-type: none">LCA/LCCSSbD

Research Interests

- **Bio based/biodegradable composites**
 - Valorization of waste cellulose and xlinked rubber (tyres, gaskets etc.)
- **Chemical and Mechanical recycling of polymers**
- **Functional natural nanotubes for packaging and agriculture application**
 - Ethylene scavenger, Antimicrobial, Phase Changing materials, O₂ scavenger, odour scavengers
- **Bio Based additives**
 - Flame retardants and Plasticizers

Networks and Memberships



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