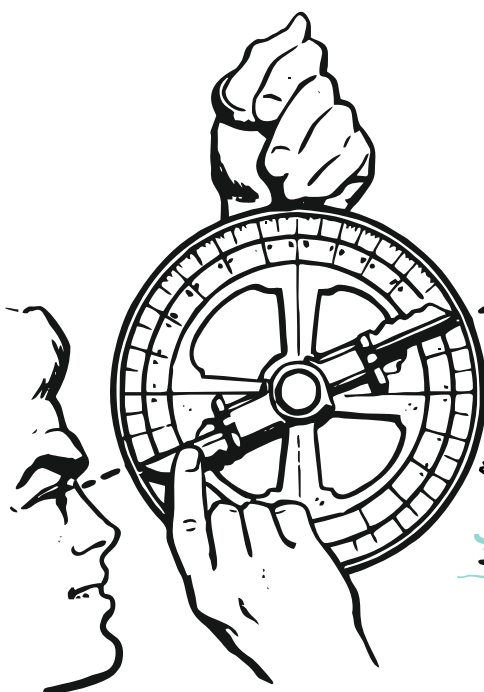




Łukasiewicz
Institute of Heavy
Organic Synthesis
BLACHOWNIA



HORIZON
europe

TOPIC ID:
HORIZON-JU-CBE-2025-RIA-03

Alternative biomanufacturing routes for natural and synthetic
rubber

Flame retardants for rubbers

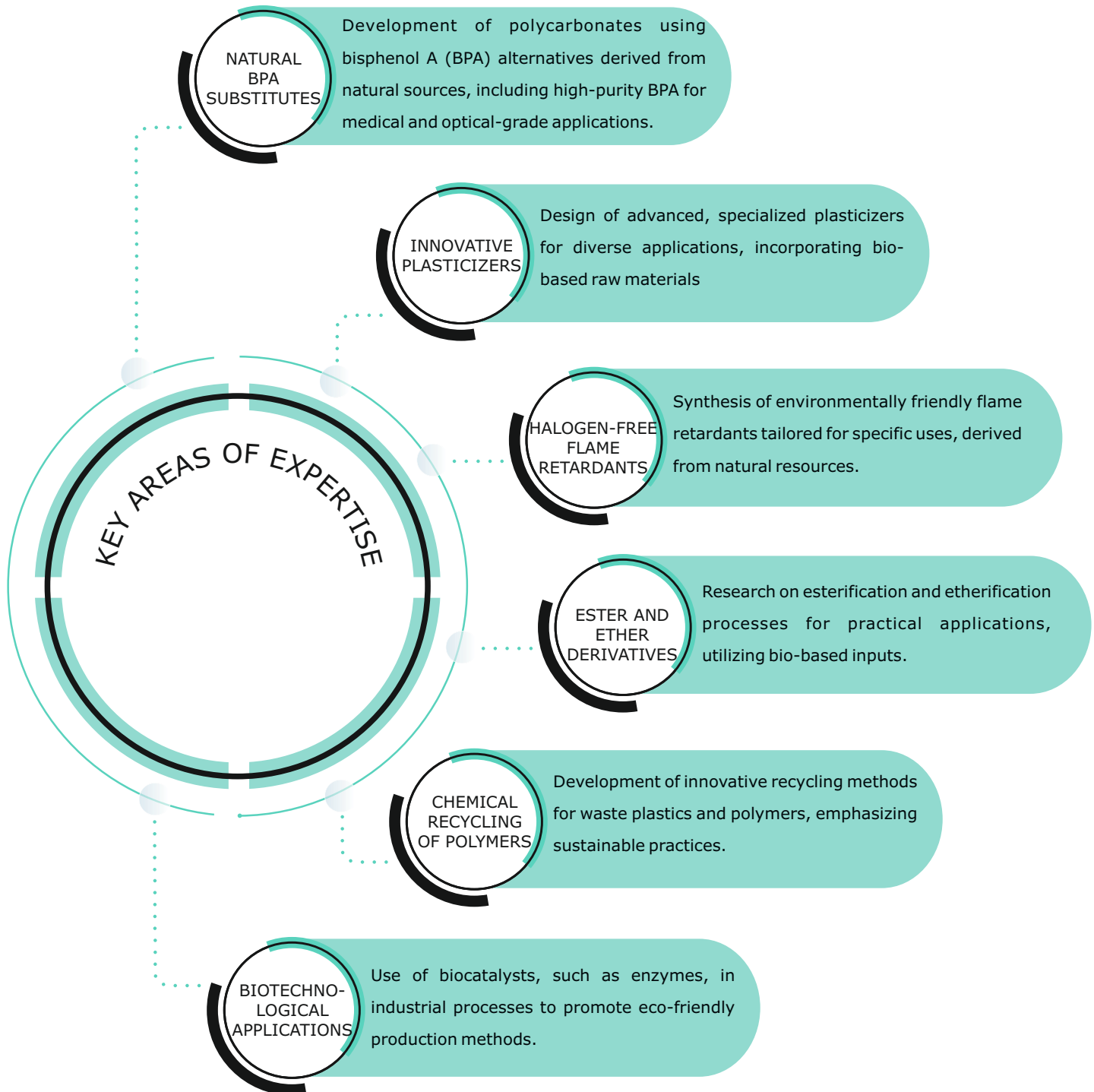
Type of project: RIA

Call opening date: 4 April 2025

Call deadline: 17 September 2025

ABOUT US

The Catalytic Processes Research Group from Łukasiewicz ICSO specializes particularly in technologies utilizing natural raw materials.



OUR IDEA

Our idea is obtaining bio-based non halogenic flame retardants for rubber applications. The idea focuses on the development of **halogen-free, non-toxic flame retardants (FRs)** derived from **natural resources**, tailored for rubber applications across various industries, including automotive, construction, industrial, healthcare, and consumer goods. The solution aims to address the pressing need for sustainable, safe, and efficient alternatives to conventional flame retardants, ensuring compliance with **EU sustainability regulations** and the **Regulation on Deforestation-Free Products**.

Within the scope of the project, the ICSO team will undertake the following activities:

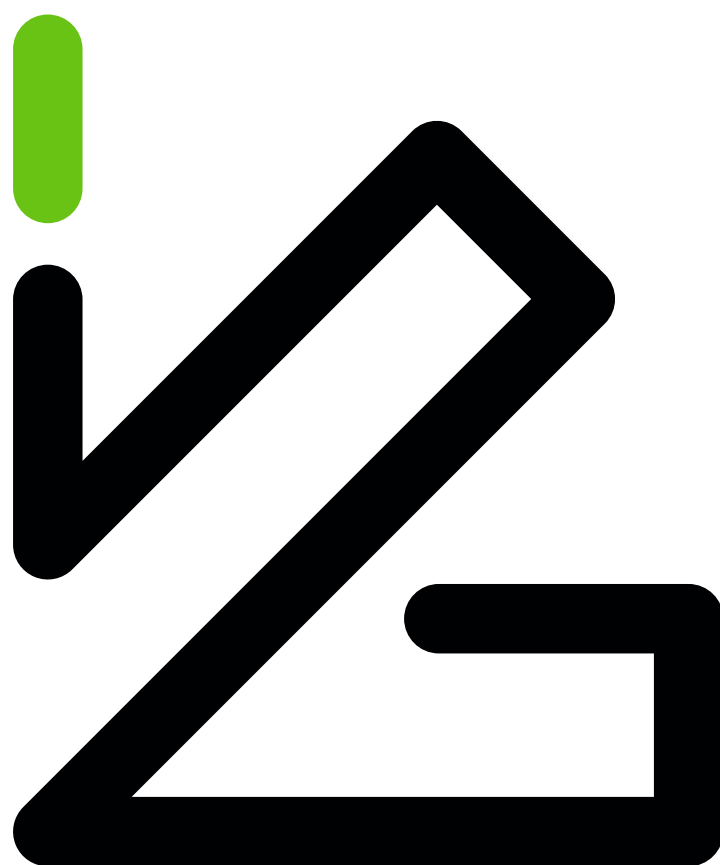
- Raw Material Selection → Identification and characterization of natural raw materials suitable for the synthesis of flame retardants, focusing on resource efficiency and environmental sustainability.
- Flame Retardant Synthesis → Development of flame retardants through laboratory-scale synthesis, followed by scale-up production to meet industrial requirements.
- Chemical Analytics → Comprehensive analysis of the synthesized flame retardants to confirm their chemical properties, safety, and flame-retardant efficiency when applied to rubber materials.

Examples of natural-origin materials with confirmed efficacy as flame retardants for rubber include:

1. **Chitosan:** A biodegradable polysaccharide derived from chitin, found in the exoskeletons of crustaceans. Chitosan has been used to enhance flame retardancy in epoxidized natural rubber composites.
2. **Tannic Acid:** A plant-derived polyphenol known for its ability to promote char formation during pyrolysis. When combined with ammonium polyphosphate, it creates a synergistic flame-retardant system for silicone rubber, reducing its flammability.
3. **Cyclodextrin:** A natural cyclic oligosaccharide used as a foaming agent in flame-retardant systems. In combination with ammonium polyphosphate, it improves the flame-retardant properties of silicone rubber.

Let's work together for innovation, sustainability, and safety in the rubber industry!





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