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Sustainable Packaging Institute SPI | Faculty of Life Sciences | Albstadt-Sigmaringen University

1 Who we are:

As part of the faculty of Life Sciences, the Sustainable Packaging Institute, short SPI, delves into research & teaching in six subjects areas. Main research focus is on **sustainable packaging concepts** for the entire Life Science Industry.

2 Our mission statement:

„We aim to provide competent and holistic support to all players in the packaging industry along the entire value chain in the Life Science Industry on their way towards a more sustainable, circular bioeconomy.“

3 Our subject areas:

The Sustainable Packing Institute SPI - Institute for Sustainable Packaging Concepts for the Life Science Industry is involved in research and teaching in the following areas:

1. Biogenic raw materials
2. Process technology and process design
3. Functional materials
4. Smart Packaging (Active and Intelligent Packaging)
5. Preservation and packaging
6. Bioeconomy and sustainability (concepts, assessment and perception)

4 Our research expertise – your benefit

- Characterisation of food and (bio)plastics
- Scientific knowledge of the process-structure-property relationships of (bio-)polymers
- Determination of property and processing profiles of packaging materials
- Adaptation of packaging concepts to the requirements of the packaged goods
- Extraction and functionalisation of packaging materials from renewable raw materials (e.g. from residues and by-products of the food and agricultural industry)
- Packaging Design for Recycling
- Smart Packaging Solutions (Active and Intelligent Packaging Concepts)
- Concepts for optimal packaging: ecological, economical, functional
- Consumer perception studies

5 Our equipment (extract):



Figure 1: Lab-Compounder & -Injection moulding, Pilot-scale compounder and flat film extrusion line (*Itr*)



Figure 2: Tensile testing, Gas and Oxygen-Permeation-Testing (*Itr*)

Further measuring equipment (extract):

- Microtome cutting device
- Differential Scanning Calorimetry (DSC)
- Fourier-transform infrared spectroscopy (FTIR)
- Atomic Force Microscopes (AFM)
- Raman spectroscopy
- Thermogravimetric Analysis (TGA)

Additional packaging characterization possibilities (extract):

- Gas permeability (all gasses for e.g.. O₂, N₂, CO₂, He) and water vapor transmission rate (WVTR)
- Mechanical properties e.g.. tensile strength
- Colour (haze, transmission, reflection)
- Surface properties (contact angle and surface energy)
- Water or oil absorption (Cobb Unger)

5 Our recent EU projects (extract of public funded projects):

- BiOnTop** - Novel packaging films and textiles with tailored end of life and performance based on bio-based copolymers and coatings | 01.06.2019 - 31.05.2023 | H2020-BBI-JTI-2018 | GA 837761
- RECOVER** - Development of innovative biotic symbiosis for plastic biodegradation and synthesis to solve their end of life challenges in the agriculture and food industries | 01.06.2020 - 31.05.2024 | H2020-BBI-JTI-2019 | GA 887648
- PRESERVE** - High performance sustainable bio-based packaging with tailored end of life and upcycled secondary use | 01.01.2021 - 31.12.2024 | H2020-NMBP-TR-IND-2018-2020 | GA 952983
- BioSupPack** - Demonstrative process for the production and enzymatic recycling of environmentally safe, superior, and versatile PHA-based rigid packaging solutions by plasma integration in the value chain | 01.06.2021 – 30.11.2024 | H2020-BBI-JTI-2020 | GA 101023685

For more information go to our website: www.hs-albsig.de/spi

SPI Project contacts at Albstadt-Sigmaringen University:

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