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Ph.D. thesis (2022-2025)
LGP2 (J. Bras; I. Desloges, J. Viguie)

Development of multilayer bio-based materials for high value-added active cellulose packaging solution

MatBio

Context / Objectives

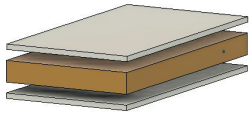
Chaire Cellulose Valley

An organisation working to:

- Upgrade cellulosic materials.
- Propose new innovative and high performance solutions.

➡ **Create a multilayer structure for active packaging.**

Active layer →



- Extend shelf life product's.
- Ensure barrier properties during storage.

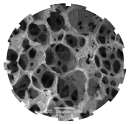
- Antimicrobial and antioxidation protection.
- Moisture protection.
- Barrier shift

Funded by:

Methods

Cellulose based intermediate layers

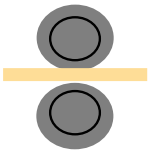
Corrugated board containing EOs



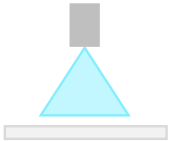
Cellulose foam containing adsorbents compounds

Processing

➡ **Preparation of active layers**

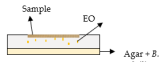


Size press impregnation

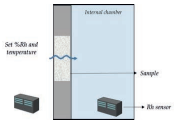


Spray

➡ **Characterization methods**



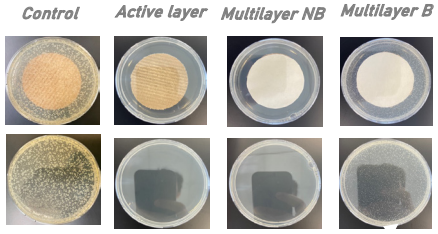
UV analysis
SPME
Microbiology test
Strawberry preservation



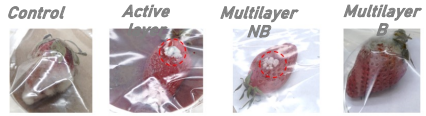
Moisture adsorption
Water vapor transmission rate
Moisture buffer capacity

Results

➡ **Controlled release of essential oils**



→ *B. Subtilis* inhibition



Strawberry preservation

➡ **Relative humidity control inside packaging atmosphere**