

Innovative Active Packaging for Extended Shelf Life Using Agri-Food Waste: Seeking Knowledge Licensing and R&D Collaboration

Summary

Profile type	Company's country	POD reference
Technology offer	Spain	TOES20240712019
Profile status	Type of partnership	Targeted countries
PUBLISHED	Research and development cooperation agreement Investment agreement	• World
Contact Person	Term of validity	Last update
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General Information

Short summary

Researchers at the university have developed an innovative active packaging that makes use of waste from the food industry. These containers are made from activated carbon obtained from waste and have excellent ethylene adsorption capacity. Therefore, it is an ideal solution to delay the ripening of fruits and vegetables, making use of the waste that is generated..

Full description

Currently, a third of the world's food for human consumption is wasted. In Spain, fruit is the product that is most wasted along with vegetables. The development of conservation technologies is essential to reduce this waste.

Fresh food products have characteristics of conservation and maturation specific to the specific product, but limited in time. In addition to being stored in optimal environmental conditions to preserve its preservation, packaging is a fundamental element in maintaining the shelf life of food.

There are different strategies to promote their conservation in packaging, from the addition of preservatives to the use of special containers. This is the case of active packaging, which has special properties that promote the stability and preservation of the food contained inside.

One of the factors that accelerate the ripening of fruits and vegetables is ethylene, a compound that they generate naturally during their metabolic process. The adsorption of this compound would increase the shelf life of the food.

In recent years, the research group has generated advanced knowledge in the use of activated carbons for use in food packaging.

In particular, work has been done on the generation of activated carbons that are incorporated into the packaging and that have high ethylene adsorption performance. The adsorption of this compound delays the ripening process of food.

To generate these activated carbons, the group has worked with agri-food waste. This biomass waste is transformed into activated carbons through a procedure designed by the researchers.

This process incorporates a series of improvements with respect to the techniques used so far since it allows a more efficient synthesis which results in lower costs, higher yield, shorter processing time and a lower amount of activating agent. The material obtained is more stable, harmless and integrated into the packaging itself.

In this way, agri-food waste can be reused to make the packaging in which the fruits and vegetables will be stored, giving them a greater conservation capacity.

All this achieves a high degree of reuse of waste, giving it a new added value and generating a circular economy solution.

Advantages and innovations

This technology has multiple advantages:

- Possibility of reusing waste that has no value and that generates an economic and environmental cost.
- The active packaging can adsorb the ethylene gas generated by food and which causes the acceleration of the degradation process.
- Increases the shelf life of food.
- Contributes to the overall reduction of food waste.
- The new process has a series of technical advantages over its predecessors, such as:
 - o More efficient method in which moisture content is not a drawback.
 - o Higher yields
 - o Shorter processing times
 - o Lower temperatures required for processing.
 - o More stable material
 - o Lower packaging saturation speed
 - o System integrated into the packaging itself
 - o Use of more sustainable chemical reagents.
 - o Possibility of being reused in successive processes.
 - o Lower replacement frequency due to high porosity
- Around 40% of the waste can be transformed into activated carbon and incorporated into the active packaging

INNOVATIVE ASPECTS

The most innovative aspect of this technology is the possibility of taking advantage of a waste that generates an economic and environmental cost, and turning it into an element of high added value that can be used by the food industry itself to produce food packaging. In addition, this packaging allows the shelf life of food to be increased, thus providing a new competitive element to the company and its products.

All this is achieved with a more efficient process that is easier to implement in the company's own facility.

Technical specification or expertise sought

Companies interested in acquiring this technology for commercial exploitation are sought through:

- Knowledge licensing agreements.
- R+D (technical cooperation) project agreement to undertake technology-related projects

Stage of development

Lab tested

Sustainable Development goals

- **Goal 13: Climate Action**
- **Goal 15: Life on Land**
- **Goal 2: Zero Hunger**
- **Goal 12: Responsible Consumption and Production**
- **Goal 9: Industry, Innovation and Infrastructure**

IPR Status

No IPR applied

Partner Sought

Expected role of the partner

They are seeking collaboration with industry partners who are interested in leveraging this innovative active packaging technology to enhance the shelf life and quality of fresh produce. The prospective partner will play a crucial role in the following areas:

1. Commercial Exploitation:

- Licensing Agreements: The partner will have the opportunity to acquire the technology through licensing agreements, enabling them to integrate the active packaging solutions into their existing product lines. This will allow for immediate commercialization and market entry.

- Production Scale-Up: The partner will be responsible for scaling up the production process, ensuring that the activated carbon-based packaging is manufactured efficiently and cost-effectively at a commercial scale.

2. Technical Cooperation:

- R&D Collaboration: Engage in joint research and development projects to further enhance the technology. This includes optimizing the activated carbon production process, improving ethylene adsorption efficiency, and exploring additional applications of the technology in various agri-food sectors.

- Product Development: Collaborate on the development of new packaging formats and solutions tailored to specific types of produce, extending the technology's benefits to a broader range of products.

3. Market Deployment:

- Market Testing and Validation: Conduct comprehensive market testing and validation of the packaging technology with various fruits and vegetables to demonstrate its efficacy in real-world conditions. This will involve pilot studies and trials to gather data on shelf life extension and overall product quality.

- **Regulatory Compliance:** Assist in navigating regulatory requirements and obtaining necessary approvals for the commercialization of the active packaging technology in different markets. This includes ensuring compliance with food safety standards and packaging regulations.

4. Sustainability Initiatives:

- Circular Economy Practices: Integrate the active packaging technology into the partner's sustainability strategy, promoting the reuse of agri-food waste and reducing overall food waste. The partner will contribute to building a circular economy by adopting environmentally friendly packaging solutions.

- Corporate Social Responsibility (CSR): Leverage the technology to enhance the partner's CSR initiatives, highlighting their commitment to sustainable practices and environmental stewardship.

5. Marketing and Distribution:

- Brand Integration: Incorporate the active packaging technology into the partner's brand identity, emphasizing the innovative and sustainable aspects of their products. This will help differentiate the partner's offerings in the competitive agri-food market.

- Distribution Network: Utilize the partner's existing distribution channels to bring the active packaging solutions to a wide range of consumers, ensuring broad market reach and impact.

By collaborating with them, the partner will gain access to cutting-edge technology that addresses critical challenges in food preservation and sustainability. Together, you can drive innovation in the agri-food sector and contribute to a more sustainable and efficient food supply chain. They invite interested companies to engage with them through knowledge licensing agreements and R&D project collaborations to realize the full potential of this groundbreaking technology.

Type of partnership

Type and size of the partner

**Research and development cooperation
agreement**
Investment agreement

- **SME 50 - 249**
- **Other**
- **Big company**
- **R&D Institution**
- **University**
- **SME <=10**
- **SME 11-49**

Dissemination

Technology keywords

- **08001003 - Food Packaging / Handling**

Targeted countries

- **World**

Market keywords

- **07003002 - Health food**
- **08001015 - Other speciality materials**
- **08004004 - Other pollution and recycling related**
- **08001023 - Other chemicals and materials (not elsewhere classified)**

Sector groups involved

- **Agri-Food**

Media

Images



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