

PET NANOCOMPOSITE WITH MODIFIED CLAYS, SHOWING IMPROVED PROPERTIES

DESCRIPTION OF THE INVENTION

ITENE has developed a modified clay which is incorporated into PET, which improves the mechanical and barrier properties of this polymer.

It consists of a clay intercalated with a polyester, preferably a polyadipate, which is more stable to high temperatures as compared to other modified clays. This allows to process the modified clay jointly with polymers that show high melting temperatures, such as PET.

Incorporating such modified clays into PET results in PET nanocomposites with improved mechanical and barrier properties and lower rigidity; whilst maintaining their thermal degradation resistance.

Given the improvement of the properties, the PET nanocomposite developed by ITENE can be advantageously used for the production of bottles, containers, bags or films. It can also be used for the storage of aqueous drinks (e.g. water, juice, milk) since loss of water vapor and CO₂ in soft drinks is minimized by using this PET nanocomposite. What is more, the PET nanocomposite of the invention can also be used for food packaging, leading to extension of the shelf life of the food product, due to its good barrier properties against the diffusion of oxygen and water vapors.

The PET nanocomposite is prepared by melt-blending PET and the modified clay. Particularly, the mixture is processed by extrusion, injection or injection-stretch-blow-moulding, thus obtaining the final manufactured article.

APPLICATION BUSINESS SECTORS

All agents of the food packaging value chain can benefit from this new development; from compounding and additive producers, through the processors (that is, producers of containers, bags, bottles and film), and to bottlers of watery beverages and food.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The new PET nanocomposite with modified clays developed by ITENE presents the following technical advantages

- Improved mechanical properties and lower rigidity
- Enhanced barrier properties against H₂O, O₂ and CO₂
- Extension of the shelf life of packed food and aqueous drinks
- Maintenance of the thermal degradation resistance of PET

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STATUS DEVELOPED OF THE TECHNOLOGY

The ITENE research group that has participated in the development of this invention has great experience and know-how in the fields of clay modification and reinforcement of polymeric matrices, as well as in the implementation of this kind of technology in user companies.

The development of this technology has been validated at pilot scale. So far, bottles made of the PET nanocomposite of the invention have been manufactured, and the good mechanical and barrier properties of such bottles have been tested and optimized.

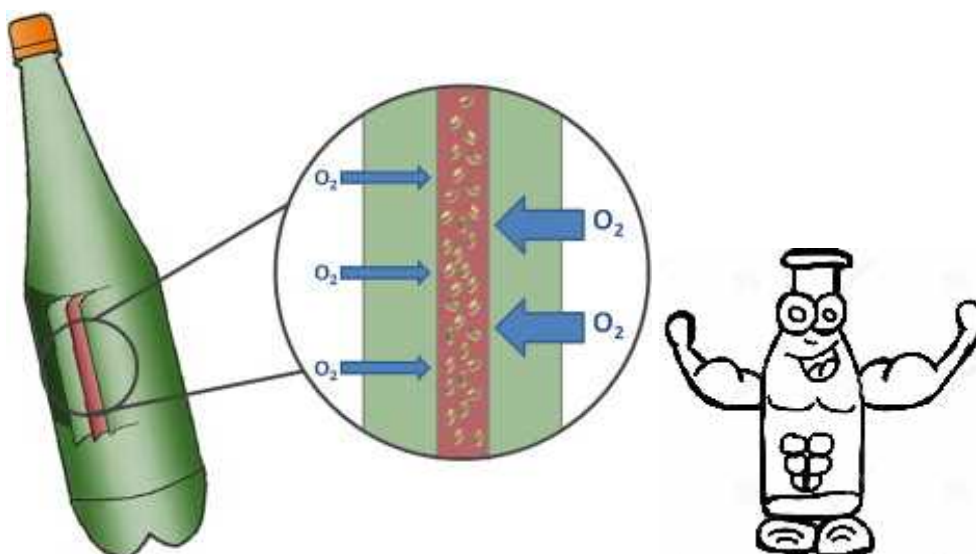
INTELLECTUAL PROPERTY RIGHTS

Patent protection has been filed for the modified clay of the invention and the PET polymer nanocomposite reinforced with the modified clay. An international patent application which claims priority from European patent application EP16382430.3 has been filed; namely PCT WO2018/050770: (<https://patentscope.wipo.int/search/es/detail.jsf?docId=WO2018050770&redirectedID=true>)

COLLABORATION SOUGHT

We are looking for user companies interested in using this technology, in order to reach with them **licensing agreements** for the manufacture, use or commercialization of the invention.

RELATED IMAGES





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