SMART POLYURETHANE PRESSURE-SENSITIVE ADHESIVE WITH CONTROLLED TACK

TECNOLOGÍA PATENTADA

DATOS DE CONTACTO:

Research Results Transfer Office-OTRI
University of Alicante
Tel.: +34 96 590 99 59
Email: areaempresas@ua.es
http://innoua.ua.es

RESUMEN

The University of Alicante has developed an innovative polyurethane pressure sensitive adhesive (PSA), that presents a controllable degree of stickiness ("tack") with respect to the current adhesives. The tack of the adhesive is changed abruptly in specific short ranges of temperature.

The adhesive is potentially biocompatible and has excellent properties for use in medical applications (dressings, bandages, ...). It can also be used in other applications such as labeling for the transport of goods or refrigerated food.

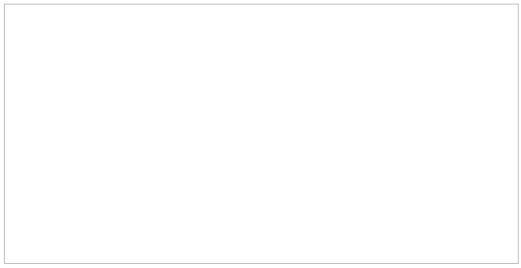
Applying a slight temperature variation, the adhesive can be easily removed, without generating waste or causing discomfort to the patient.

VENTAJAS Y ASPECTOS INNOVADORES

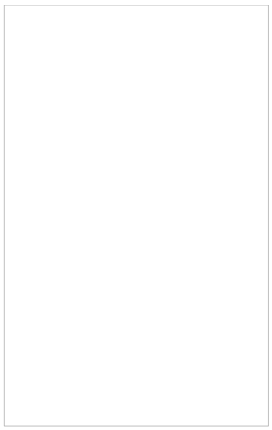
The adhesive developed by the researchers of the university is a pressure sensitive adhesive (PSA) based on polyurethane without the need of adding tackifier, so it has the usual advantages of these adhesives that provide them with excellent conditions for medical use.

In addition, polyurethane PSA incorporates a series of advantages that provide unique features such as the following:

- It presents a **permanent stickiness** when applying a light pressure with the fingers. **It does not require activation** for its application, it **maintains the joint to the substrate in time and leaves no residue upon removal.**
- Polyurethane PSA adhesives are more **hydrophilic and biocompatible** than other PSA adhesives.
- The developed adhesive shows a **good skin tolerance.**



- The new formulation has managed to solve the main drawbacks of the polyurethane PSA, i.e., its low tack at room temperature, obtaining **optimum adhesion properties**, without sacrificing its cohesion.



- The adhesion of the new polyurethane PSA adhesives can be modified in a wide range of values by changing their segmented structure, and the adhesives are completely transparent.

- By varying the synthesis process, the tack can be controlled on demand by customizing the temperature ranges in which the adhesive is active.

- Adhesion **can be easily removed by slight variation of the temperature.**

Thermoplastic polyurethane PSA adhesives have many advantages for application in industry or the biomedical sector, but their main disadvantage is their low tack and limited peel adhesion.

The work of the university's researchers has made possible to overcome these weaknesses and to develop a procedure to obtain a family of adhesives with high tack and good peel strength in specific temperature ranges only, decreasing considerably when these limits are exceeded.

This allows to obtain a smart adhesive that can be adapted to the needs of the client's application, customizing the degree of stickiness and the temperature ranges in which it is active.

The new polyurethanes do not contain solvents and they can be applied on the carrier at moderate temperatures (lower than 120 ºC).

APLICACIONES DE LA OFERTA

The following sectors of interest have been identified:

Biomedical Sector

Body temperature conditions are very stable. A number of polyurethane pressure sensitive adhesives have been developed that operate only in these temperature ranges. This has a great applicability for example in the fixation of bandages on the skin. In addition, by slightly varying the temperature, the tack can be eliminated, avoiding patients the usual discomfort of removing the bandages.

Labelling sector

This technology also has great potential in the labelling sector. There are containers and packages in all types of industries and these must be labeled and wrapped for proper treatment.

Sometimes these packages must operate in very specific temperature conditions. This technology makes it possible to define optimum tack in very specific short temperature range, outside of which adhesive tack is considerably reduced. Good label condition can be a good indicator that the package has maintained the preset temperature conditions over time.

It can also be useful for removing labels from products once they have fulfilled their function. By slightly varying the temperature of the label, they are easily detached.

COLABORACIÓN BUSCADA

Researchers are looking for partners to negotiate patent licensing agreements, as well as to develop R&D projects to look for new applications for adhesives.