NOVEL SELF-EXPANDING POLYURETHANE FOAMS INTENDED FOR INERT FILLING OF PLEURAL AND OTHER HUMAN CAVITIES.

PATENTED TECHNOLOGY

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ABSTRACT

The Adhesion and Adhesives Laboratory of the University of Alicante has developed a new polymeric foaming material for in-situ filling and sealing of internal irregular different shaped human cavities, intended for patients suffering chronic pleural cavities and in-field injuries caused by bullets or accidental event leaving open blood vessels.

The new foam is composed of two separate liquid components that can be mixed in a two-body syringe in such a way that the foaming time can be modulated for allowing the foam formation at the end of the syringe needle. The new polymeric foam can self-expanded and self-modelated for avoiding complications in open internal cavities caused by infections, blooding, fistulae, dyspnea or sepsis. The new foam is easily applicable, safe for biological tissues, and its use avoid the use of the current aggressive treatments in pleural cavities. It is looking for companies interested in acquiring this technology for its commercial exploitation.

ADVANTAGES AND INNOVATIVE ASPECTS

MAIN ADVANTAGES OF THE TECHNOLOGY

The new polyurethane foams show the following particularities:

- They are easy to apply, even throughout very small orifices.
- They are self-expandable and self-modelled as by controlling the time after mixing the two components and in the presence of moisture, they expand spontaneously, filing the cavity completely.
- They show null adhesion to the surrounding tissues, and their surfaces are impermeable.
- They have very low density (i.e. low weight).
- The foam can be extracted easily from the internal cavity.
- They are biocompatible and show low risk of tocixity, carcinogenesis and local clinical complications.
- They can be dosed into open or closed cavities.
- They can be applied in the presence of blood or biological liquids.
- The resulting foams do not deteriorate with time and are stable.

The new polyurethane foams can be formulated for rending flexible, semi-rigid or rigid foams, and in all cases, an homogeneous size and cell distribution is obtained, and all them show adequate mechanical resistance.

INNOVATIVE ASPECTS

The new polyurethane foam is intended for filling internal human or animal cavities having different shapes and sizes, showing the following

particularities:

- Lack of toxicity, hypersensibility, carcinogenesis, post-surgical and complications.
- It does not cause infections.
- It does not affect the healing and fistulae formation is not favoured.
- The full cavity can be completely filled irrespective of its size and shape.
- The foam has a poor adhesion to the surrounded tissues.
- The foam is light (i.e. low weight), and it can be easily removed, if necessary.
- The foam does not interfere the heart or diaphragma movements.
- The foam is impermeable to biological fluids, water and blood.
- The foam has hemostatic effect.
- The foam allows the sealing of parenchima or bronquial fistulae.
- The foam can be easily applied and dosed into the internal cavities.
- The foam is stable over time and does not deteriorate in contact with biological fluids.

MARKET APPLICATIONS

The present invention can be applied in the **Biomedical** and **Veterinary** for the filling of internal cavities. It can be also used in accidental and in-field lesions or injuries causing blood bleeding.

COLLABORATION SOUGHT

It is looking for companies interested in acquiring this invention for commercial exploitation through the following ways:

- License agreement of the patent.
- In search for financial opportunities to develop new applications, adapt them to specific needs of the company, etc.
- Agreements for technology and knowledge transference.
- Technical reports and scientific assessment.
- Offer specific training depending on the companies needs.
- Standardization services, calibration, national and international technical rules, etc.
- Offer technological support on those technologies that require high preparation or sophisticated instruments that are not in the companies grasp.
- Staff exchange for specific periods of time (to learn specific techniques).

Rent the internal equipment to clients that wish to continue their own tests (the infrastructure of the Department of Inorganic Chemistry – Adhesion and Adhesives Laboratory - or the Technical Services of Research of the University of Alicante (SSTTI)).