

MODIFIED PAEK POLYMER: PREPARATION AND USES

ABSTRACT

The present invention relates to a modified polyaryletherketone polymer (PAEK), e.g. PEEK, with chemically modified surfaces suitable for "click" reactions, and to a process to obtain it.

It also relates to the conjugated biomaterials derived thereof, PAEK type materials with surfaces modified with a RGD (Arg- Gly- Asp) and/or OGP10-14 (Tyr-Gly-Phe-Gly-Gly) peptidomimetics and to a process to obtain it. Finally, the present invention also relates to a fluorescent PAEK material.

These materials are particularly useful for manufacturing medical devices or tissue engineering or cell culture matrices.

This invention was developed by researchers from the University of the Basque Country (UPV), TECNALIA and Biomedical Research Networking Centre in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN).

DESCRIPTION

PAEK is a thermoplastic with acceptable biocompatibility that can be used in the manufacturing of implants and prosthetic devices. However, more advanced medical applications require an active role of the biomaterial to promote the adhesion, proliferation and/or differentiation of specific cells. The present invention relates to the development of a new modified PAEK, e.g. PEEK, where the excellent mechanical, chemical and structural properties of the PAEK polymer are preserved in the bulk material, while different physical or biological properties are conferred by the components grafted to the surface.

The different aspects of the present invention are:

- A modified PAEK polymer comprising aromatic rings with ether and ketones linkages.
- A process for producing modified PAEK polymer.
- Use of the modified PAEK for preparing PAEK type derivatives with surfaces containing covalently bonded fluorescent molecules, polymers, peptides, proteins, or saccharides.
- A medical device made of the PAEK.
- A conjugated PAEK polymer modified with a RGD mimetic.
- A process for producing a conjugated PAEK polymer.
- A medical device or a tissue engineering matrix or cell culture matrix comprising a PAEK polymer with a surface modified with an RGD mimetic.
- A fluorescent conjugated PAEK polymer.

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APPLICATIONS

Production of Medical devices

Manufacturing of Tissue engineering products

Production of cell culture matrices

DEVELOPMENT STATUS

Developed

IP STATUS

Patent pending

AVAILABLE FOR

- Exclusive license agreement
- Non-exclusive license agreement
- Further research or development

INDUSTRIAL PROPERTY

European Patent Application
EP12382534.1, filed on December 26, 2012

International Patent Application
PCT/ES2013/070928, filed on December 26, 2013

National Phases in Europe, USA, Canada, China, and Korea

TECHNOLOGICAL OFFER

INNOVATIVE ASPECTS AND ADVANTAGES

Production of a modified PAEK polymer, e.g. PEEK, with a linker endowed with latent conjugation reactivity ("click").

Possibility to incorporate biologically active components, labelling components or other compounds to the surface of the material with a copper-free click reaction.

Possibility to maintain a sustained functionality along time.

Improvement of osteointegration properties.

Surface treated biomaterials show enhanced osteoblast adhesion and improved osteoinduction properties.

See Patent **EP12382535.8**
(Preparation of a new RGD mimetics "ready-for-click") as complement of this .

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