

Title (en)
METHOD OF PREPARATION OF HIERARCHICALLY STRUCTURED SELF-REINFORCING COMPOSITE SYSTEMS BASED ON BIOPOLYMERS OF POLYLACTIC ACID, AND SUCH COMPOSITE SYSTEMS

Title (de)
VERFAHREN ZUR HERSTELLUNG HIERARCHISCH STRUKTURIERTER SELBSTVERSTÄRKENDER VERBUNDSYSTEME AUF BASIS VON BIOPOLYMEREN VON POLYMILCHSÄURE UND DERARTIGE VERBUNDSYSTEME

Title (fr)
PROCÉDÉ DE PRÉPARATION DE SYSTÈMES COMPOSITES AUTORENFORÇANTS STRUCTURÉS HIÉRARCHIQUEMENT À BASE DE BIOPOLYMÈRES D'ACIDE POLYLACTIQUE, ET DE TELS SYSTÈMES COMPOSITES

Publication
EP 4355938 A1 20240424 (EN)

Application
EP 22760646 A 20220629

Priority
CZ 2022050060 W 20220629

Abstract (en)
[origin: WO2024002398A1] The invention relates to a method of preparation of hierarchically structured self-reinforcing composite systems based on biopolymers of polylactic acid, in which a polymer solution is prepared, containing 5 to 15 wt. % of poly(L- lactide) or symmetric or asymmetric mixtures of poly(L-lactide) and poly(D- lactide) and 85 to 95 wt. % of a solvent system consisting of a mixture of dichloromethane, dimethyl sulfoxide and pyridine in the ratio (3 to 7.5) : (1.5 to 4) : (0.5 to 3.5). This solution is transformed into nanofibers of poly(L-lactide) or mixtures of poly(L-lactide) and poly(D-lactide) by spinning, wherein these nanofibers, after their formation, are deposited on the surface of a fibrous core (2) made from polylactic acid biopolymer, which rotates or balloons around its longitudinal axis, whereby a two-component core yarn based on polylactic acid is prepared. Subsequently, a flat fabric is formed from this yarn, wherein at least one layer of the flat fabric is deposited at elevated temperature and pressure in a matrix (5) based on a polylactic acid biopolymer with a melting temperature lower than or equal to the melting temperature of a nanofibrous sheath (3) of the two- component core yarn, wherein during deposition the structure of the flat fabric is saturated with the matrix (5), thereby creating a hierarchically structured self- reinforcing composite system based on polylactic acid biopolymers, which consists of 5 to 35 wt. % of a two-component core yarn based on polylactic acid.

IPC 8 full level
D01D 5/00 (2006.01); **D01D 5/18** (2006.01); **D01F 6/62** (2006.01); **D01F 8/14** (2006.01); **D02G 3/36** (2006.01); **D02G 3/38** (2006.01); **D03D 15/292** (2021.01); **D04B 1/14** (2006.01)

CPC (source: EP)
D01D 5/0038 (2013.01); **D01D 5/0084** (2013.01); **D01D 5/18** (2013.01); **D01F 6/625** (2013.01); **D01F 8/14** (2013.01); **D02G 3/02** (2013.01); **D03D 15/225** (2021.01); **D03D 15/33** (2021.01); **D03D 15/47** (2021.01); **D10B 2201/20** (2013.01); **D10B 2331/041** (2013.01); **D10B 2331/30** (2013.01); **D10B 2401/12** (2013.01); **D10B 2505/02** (2013.01)

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

Designated validation state (EPC)
KH MA MD TN

DOCDB simple family (publication)
WO 2024002398 A1 20240104; EP 4355938 A1 20240424

DOCDB simple family (application)
CZ 2022050060 W 20220629; EP 22760646 A 20220629