

Title (en)
METHOD FOR PRODUCING PURIFIED NITRILE RUBBERS

Title (de)
VERFAHREN ZUR HERSTELLUNG VON GEREINIGTEN NITRILKAUTSCHUKEN

Title (fr)
PROCEDE POUR LA PRODUCTION DE CAOUTCHOUCS NITRILE ÉPURÉS

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Application
EP 12799185 A 20121211

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Abstract (en)
[origin: EP2610296A1] Producing a purified nitrile rubber, comprises (i) carrying out ultrafiltration of the nitrile rubber dissolved in at least one organic solvent at 10-150[deg] C under a pressure of 1-80 bar by repeatedly conducting the nitrile rubber through an ultrafiltration membrane, (ii) obtaining a retentate stream containing the purified nitrile rubber, which does not flow through the membrane, and a permeate stream containing Diels-Alder addition products, which flow through the ultrafiltration membrane, and (iii) adjusting the flow rate of the retentate stream to a value greater than 0.2 m/second. Producing a purified nitrile rubber, comprises (i) carrying out ultrafiltration of the nitrile rubber at 10-150[deg] C under a pressure of 1-80 bar by repeatedly conducting the nitrile rubber through an ultrafiltration membrane, which is dissolved in at least one organic solvent, (ii) obtaining a retentate stream containing the purified nitrile rubber, which does not flow through the ultrafiltration membrane, and a permeate stream containing Diels-Alder addition products, which flow through the ultrafiltration membrane, and (iii) adjusting the flow rate of the retentate stream during the ultrafiltration to a value greater than 0.2 m/second, where the content of the Diels-Alder addition products in the purified nitrile rubber is reduced to at least 50 wt.% compared to the level in the originally used nitrile rubber by ultrafiltration. The nitrile rubber comprises the repeating units of at least one conjugated diene monomer and at least one alpha , beta -unsaturated nitrile-monomer, and/or their Diels-Alder addition products. The ultrafiltration membrane comprises at least one porous layer and the layer with the smallest pores has a pore diameter of 1-200 nm. Independent claims are also included for: (1) the nitrile rubber obtainable by the above mentioned method, comprising (x) repeating units derived from at least one conjugated diene, at least one alpha , beta -unsaturated nitrile and optionally at least one further copolymerizable monomer, and (y) at least one structural element of the formulas (Z-(M) n)-(X) t-C(=S)-S- (I), (- (M) m)-R (II), (-S-C(=O)-S-) (III), (-S-C(=O)-S-(M) m-R) (IV) or (Z-(M) n) (V) ; (2) preparing a vulcanizate, comprising vulcanizing the above mentioned nitrile rubber; and (3) the vulcanizate based on the above mentioned nitrile rubber. Z : H, alkyl (optionally branched, and optionally saturated), carbo- or heterocyclyl (optionally branched, and optionally saturated), aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkoxy, aryloxy, heteroaryloxy, amino, amido, hydroxyimino, carbamoyl, alkoxy-carbonyl, F, Cl, Br, I, OH, phosphonato, phosphinato, alkylthio, arylthio, sulfanyl, thiocarboxy, sulfanyl, sulfono, sulfino, sulfeno, sulfonic acid, sulfamoyl, silyl, silyloxy, nitrile, carbonyl, carboxyl, oxycarbonyl, oxysulfonyl, oxo, thioxo, borates, selenates, epoxy, cyanates, thiocyanates, isocyanates, isocyanide and thioisocyanate; R : Z (when m is not equal to 0) or H, alkyl (optionally branched, and optionally saturated), carbo- or heterocyclyl (optionally branched, and optionally saturated), aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkoxy, aryloxy, heteroaryloxy, amino, amido, carbamoyl, alkoxy, aryloxy, alkylthio, arylthio, thiol, thiocarboxy, sulfanyl, sulfono, sulfino, sulfeno, sulfonic acids, sulfamoyl, carbonyl, carboxyl, oxycarbonyl, oxysulfonyl, oxo, thioxo, epoxy, cyanate, thiocyanate, isocyanate, thioisocyanate or isocyanides (when m is equal to 0); M : repeating units of at least one mono-or polyunsaturated monomer comprising conjugated or non-conjugated diene, alkyne and vinyl compound, or structural element, which is derived from polymers comprising polyether, preferably polyalkylene glycol ethers and polyalkylene oxide, polysiloxane, polyols, polycarbonates, polyurethanes, polyisocyanates, polysaccharides, polyesters and polyamides; n, m : 0-10000 (optionally different); t : 0 (when n is equal to 0) or 1 (when n is not equal to 0); and X : C(Z 2), N(Z), P(Z), P(=O)(Z), O, S, S(= O) or S(=O) 2.

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