polyether alcohols disclosed there are also described.

JP H0656943, discloses a method for preparing a polymeric polyol composition, which comprises polymerizing a vinyl monomer in a polyol in the presence of a dispersant comprising a block copolymer wherein segments X compatible with the polyol and having a solubility parameter different from that of the polyol by at most 1.0 are linearly combined with segments Y compatible with the polymer of the vinyl monomer and having a solubility parameter different from that of the vinyl polymer by at most 2.0.

A disadvantage of the known graft polyols or graft polyol dispersions is that their preparation firstly requires a complicated synthesis of macromers which are then used in the polymerization. The polymerization itself also requires a high level of safety measures. The need to remove unreacted residual monomer after the reaction is likewise a disadvantage.

Starting out from this prior art, it was an object of the present invention to provide polyol dispersions which can be produced simply and inexpensively.

A further object of the invention was to provide polyol dispersions whose properties can easily be adapted.

According to the invention, this object is achieved by a polyol dispersion at least comprising

(i) at least one polyol and
(ii) at least one polymer particle mixture comprising at least one thermoplastic polymer (P) and at least one block copolymer (B),

wherein the block copolymer (B) has at least one block which is compatible with the thermoplastic polymer (P) and at least one block which is compatible with the polyol.

For the purposes of the present invention, a polyol is a polyalcohol, and for the purposes of the present patent application can also be a polyol mixture having a molecular weight distribution.

For the purposes of the present invention, polymers or block copolymers are polymeric compounds which can be characterized by methods known to those skilled in the art for polymers and usually have a molecular weight distribution. The structure of the individual molecules can also differ within the distribution usual for polymers.

For the purposes of the present invention, a polymer particle mixture is a mixture of polymer particles in which all polymer particles of the respective polymer particle mixture comprise the same thermoplastic polymer (P) and the same block copolymer (B) but, for example, the ratio of the thermoplastic polymer (P) to the block copolymer (B) in the individual polymer particles differs or the particle diameter of the individual polymer particles differs.

polyoxyethylene polyols, have a functionality of preferably from 2 to 8 and in particular from 2 to 3 and mean molecular weights of from 300 to 8000 g/mol, preferably from 300 to 6000 g/mol and in particular from 1000 to 5000 g/mol. Suitable polyoxytetramethylene glycols have, for example, a mean molecular weight up to about 3500 g/mol.

The polyhydroxy compounds, in particular polyether polyols, can be used individually or in the form of mixtures.

Apart from the polyether polyols described, it is also possible to use, for example, polyether polyamines and/or further polyols selected from the group consisting of polyester polyols, polythioether polyols, polyesteramides, hydroxyl-comprising polyacetals and hydroxyl-comprising aliphatic polycarbonates or mixtures of at least two of the polyols mentioned.

The hydroxyl number of the polyhydroxyl compounds is generally from 20 to 80 and preferably from 28 to 70.

Suitable polyester polyols can be prepared, for example, from organic dicarboxylic acids having from 2 to 12 carbon atoms, preferably aliphatic dicarboxylic acids having from 4 to 6 carbon atoms, and polyhydric alcohols, preferably diols, having from 2 to 12 carbon atoms, preferably from 2 to 6 carbon atoms, by customary methods. The organic polycarboxylic acids and/or derivatives thereof and polyhydric alcohols are usually polycondensed, advantageously in a molar ratio of from 1:1 to 1:1.8, preferably from 1:1.05 to 1:1.2, in the absence of catalysts or preferably in the presence of esterification catalysts, advantageously in an atmosphere of inert gas such as nitrogen, carbon monoxide, helium, argon, ~~etc.~~ in the melt at temperatures of from 150 to 250°C, preferably from 180 to 220°C, if appropriate under reduced pressure, to the desired acid number which is advantageously less than 10, preferably less than 2.

Possible hydroxyl-comprising polyacetals are, for example, the compounds which can be prepared from glycols such as diethylene glycol, triethylene glycol, 4,4'-dihydroxyethoxydiphenyldimethylmethane, hexanediol and formaldehyde. Suitable polyacetals can also be prepared by polymerization of cyclic acetals. Possible polycarbonates having hydroxyl groups are those of the type known per se, which can be prepared, for example, by reaction of diols such as 1,3-propanediol, 1,4-butanediol and/or 1,6-hexanediol, diethylene glycol, triethylene glycol or tetraethylene glycol with diaryl carbonates, e.g. diphenyl carbonate, or phosgene. Polyesteramides include, for example, the predominantly linear condensates obtained from polybasic, saturated and/or unsaturated carboxylic acids or their anhydrides and polyhydric saturated and/or

and propylene oxide is grafted. The surface-active substances are usually used in amounts of from 0.01 to 5% by weight, based on 100% by weight of the other components used.

For the purposes of the present invention, fillers, in particular reinforcing fillers, are the known and customary organic and inorganic fillers, reinforcing materials, weighting agents, agents for improving the abrasion behavior in paints, coating compositions~~, etc~~. Specific examples are: inorganic fillers such as siliceous minerals, for example sheet silicates such as antigorite, serpentine, hornblendes, amphiboles, chrysotile and talc, metal oxides such as kaolin, aluminum oxides, titanium oxides and iron oxides, metal salts such as chalk, barite and inorganic pigments such as cadmium sulfide and zinc sulfide, and also glass~~, etc~~. Preference is given to using kaolin (china clay), aluminum silicate and coprecipitates of barium sulfate and aluminum silicate and also natural and synthetic fibrous minerals such as wollastonite, metal fibers and in particular glass fibers of various lengths which may, if appropriate, also be coated with a size. Possible organic fillers are, for example: carbon, rosin, cyclopentadienyl resins and graft polymers and also cellulose fibers, polyamide, polyacrylonitrile, polyurethane, polyester fibers based on aromatic and/or aliphatic dicarboxylic esters and in particular carbon fibers. The inorganic and organic fillers can be used individually or as mixtures and are advantageously added to the reaction mixture in amounts of from 0.5 to 50% by weight, preferably from 1 to 40% by weight, based on the weight of the other components used, but the content of mats, nonwovens and woven fabrics composed of natural and synthetic fibers can reach values up to 80% by weight.

Further details regarding the abovementioned other customary auxiliaries and additives may be found in the technical literature, for example the monograph by J. H. Saunders and K. C. Frisch "High Polymers" volume XVI, "Polyurethanes", parts 1 and 2, Interscience Publishers 1962 and 1964, or the above-cited Kunststoffhandbuch, "Polyurethane", volume VII, Hanser-Verlag, Munich, Vienna, 1st to 3rd edition.

To produce the polyurethanes according to the invention, the organic and/or modified organic polyisocyanates, the polyol dispersion and, if appropriate, the further compounds having hydrogen atoms which are reactive toward isocyanates and also further constituents are reacted in such amounts that the equivalence ratio of NCO groups of the polyisocyanates to the sum of the reactive hydrogen atoms of the other components is less than 0.95:1, preferably less than 0.70:1.

Polyurethane foams can be produced, for example, by the one-shot process, for example by means of the high-pressure or low-pressure technique, in open or closed molds, for example metallic molds. Continuous application of the reaction mixture to

Claims

1. A polyol dispersion at least comprising

   (i) at least one polyol selected from the group consisting of polyetherols and polyesterols,

   (ii) at least one polymer particle mixture comprising at least one thermoplastic polymer (P) selected from polystyrene, substituted polystyrenes, polyacrylates, polymethacrylates, polyolefins, polyvinylchloride, polyacrylonitrile, polyesters, polyamides and copolymers of the mentioned polymers and at least one block copolymer (B) selected from the group consisting of polyester-polyether-blockcopolymers polyamide-polyether-blockcopolymers,polystyrene-polyether-blockcopolymers or polyethylene-polyether-blockcopolymers,

   wherein the block copolymer (B) has at least one block which is compatible with the thermoplastic polymer (P) and at least one block which is compatible with the polyol, wherein the at least one block copolymer (B) is comprised in an amount of from 0.1 to 10% by weight, based on the total weight of the thermoplastic polymer (P) used, in the polymer particle mixture, and wherein all polymerparticles of the respective mixture of polymerparticles contain the same thermoplastic polymer (P) and the same blockcopolymer (B).

2. The polyol dispersion according to claim 1, wherein the at least one thermoplastic polymer (P) is selected from the group consisting of polystyrene, polyethylene and polyethylene terephthalate.

3. The polyol dispersion according to any of claims 1 or 2, wherein the polyol dispersion has a solids content of from 5 to 65% by weight.

4. The polyol dispersion according to any of claims 1 to 3, wherein the polymer particle mixture comprised in the polyol dispersion has a mean particle diameter in the range from 0.01 to 5.0 micrometer.

5. A process for producing a polyol dispersion, which comprises the steps

   (a) heating of a composition (I) comprising at least one thermoplastic polymer (P) selected from polystyrene, substituted polystyrenes, polyacrylates,

polymehtacrylates, polyolefins, polyvinylchloride, polyacrylonitrile, polyesters, polyamides and copolymers of the mentioned polymers, at least one polyol selected from the group consisting of polyetherols and polyesterols, and at least one block copolymer (B) selected from the group consisting of polyester-polyether-blockcopolymers polyamide-polyether-blockcopolymers,polystyrene-polyether-blockcopolymers or polyethylene-polyether-blockcopolymers having at least one block which is compatible with the thermoplastic polymer (P) and at least one block which is compatible with the polyol to give a composition (II),

(b) cooling of the composition (II).

6. The process according to claim 5, wherein the at least one thermoplastic polymer (P) is selected from the group consisting of polystyrene, polyethylene and polyethylene terephthalate.

7. The process according to claim 5 or 6, wherein the at least one block copolymer (B) is used in an amount of from 0.1 to 10% by weight, based on the total weight of the thermoplastic polymer (P) used.

8. The process according to any of claims 5 to 7, wherein step (a) of the process is carried out with stirring.

9. The use of a polyol dispersion according to any of claims 1 to 4 or a polyol dispersion obtainable by a process according to any of claims 5 to 8 for producing polyurethanes.

10. A process for producing polyurethanes, wherein at least one polyol dispersion according to any of claims 1 to 4 or a polyol dispersion obtainable by a process according to any of claims 5 to 8 is reacted with at least one polyisocyanate.

## Claims

1. A polyol dispersion at least comprising

   (i) at least one polyol selected from the group consisting of polyetherols and polyesterols,

   (ii) at least one polymer particle mixture comprising at least one thermoplastic polymer (P) selected from polystyrene, substituted polystyrenes, polyacrylates, polymethacrylates, polyolefins, polyvinylchloride, polyacrylonitrile, polyesters, polyamides and copolymers of the mentioned polymers and at least one block copolymer (B) selected from the group consisting of polyester-polyetherblock-copolymers polyamide-polyether-blockcopolymers, polystyrene-polyether-blockcopolymers or polyethylene-polyether-blockcopolymers,

   wherein the block copolymer (B) has at least one block which is compatible with he thermoplastic polymer (P) and at least one block which is compatible with the polyol, wherein the at least one block copolymer (B) is comprised in an amount of from 0.1 to 10% by weight, based on the total weight of the thermoplastic polymer (P) used, in the polymer particle mixture,

   wherein all polymerparticles of the respective mixture of polymerparticles contain the same thermoplastic polymer (P) and the same blockcopolymer (B), and

   wherein the thermoplastic polymer (P) has a mean molecular weight of from 50,000 to 5,000,000 g/mol.

2. The polyol dispersion according to claim 1, wherein the at least one thermoplastic polymer (P) is selected from the group consisting of polystyrene, polyethylene and polyethylene terephthalate.

3. The polyol dispersion according to any of claims 1 or 2, wherein the polyol dispersion has a solids content of from 5 to 65% by weight.

4. The polyol dispersion according to any of claims 1 to 3, wherein the polymer particle mixture comprised in the polyol dispersion has a mean particle diameter in the range from 0.01 to 5.0 micrometer.

5. A process for producing a polyol dispersion, which comprises the steps

(a) heating of a composition (I) comprising at least one thermoplastic polymer (P) selected from polystyrene, substituted polystyrenes, polyacrylates, polymethacrylates, polyolefins, polyvinylchloride, polyacrylonitrile, polyesters, polyamides and copolymers of the mentioned polymers, at least one polyol selected from the group consisting of polyetherols and polyesterols, and at least one block copolymer (B) selected from the group consisting of polyester-polyether-blockcopolymers polyamide-polyetherblockcopolymers, polystyrene-polyether-blockcopolymers or polyethylenepolyether-blockcopolymers having at least one block which is compatible with the thermoplastic polymer (P) and at least one block which is compatible with the polyol to give a composition (II),

(b) cooling of the composition (II)

wherein the thermoplastic polymer (P) has a mean molecular weight of from 50,000 to 5,000,000 g/mol.

6. The process according to claim 5, wherein the at least one thermoplastic polymer (P) is selected from the group consisting of polystyrene, polyethylene and polyethylene terephthalate.

7. The process according to claim 5 or 6, wherein the at least one block copolymer (B) is used in an amount of from 0.1 to 10% by weight, based on the total weight of the thermoplastic polymer (P) used.

8. The process according to any of claims 5 to 7, wherein step (a) of the process is carried out with stirring.

9. The use of a polyol dispersion according to any of claims 1 to 4 or a polyol dispersion obtainable by a process according to any of claims 5 to 8 for producing polyurethanes.

10. A process for producing polyurethanes, wherein at least one polyol dispersion according to any of claims 1 to 4 or a polyol dispersion obtainable by a process according to any of claims 5 to 8 is reacted with at least one polyisocyanate.