Claims

1. Process for preparing polyether polyols based on starter compounds having Zerevitinov-active hydrogen atoms, having n E_n blocks each comprising at least 75% by weight of oxyethylene units, and m P_m blocks each comprising at least 60% by weight of oxypropylene units, where n and m are each natural numbers from 1 to 10, wherein at least one starter compound having at least one Zerevitinov-active hydrogen atom is being reacted in the process with ethylene oxide and propylene oxide with addition of a catalyst, and the at least one starter compound having a melting point of ≥40°C,

characterized in that

the reaction with propylene oxide is effected during the metered addition of the P_m block(s) under the conditions of the following inequation:

$$\frac{x_m(PO)}{x(OH) * t_m(PO) * OHZ} < 0.0060$$

in [g/(h*{mg KOH})] (1)

where

x_m(PO) is defined as the molar amount of propylene oxide metered in for the P_m block in mol,

x(OH) is defined as the molar amount of hydroxyl groups in the polyether polyol in mol,

t_m(PO) is defined as the metering time for the propylene oxide of the P_m block in hours,

OHZ is defined as the calculated OH number of the polyether polyol in mg KOH/g, and

m is as defined above,

and where the total content of oxyethylene units in the polyether polyol, based on the total mass of the alkylene oxides metered in, is from 5 to 90% by weight.

2. Process according to Claim 1, characterized in that the P_m block comprises or the P_m blocks comprise at least 75% by weight of oxypropylene units, based on the total mass of the alkylene oxides metered in for this block or these blocks.

3. Process according to either of the preceding claims, characterized in that the polyether polyols contain up to 85% by weight of oxyethylene units, based on the total mass of the alkylene oxides metered in.

4. Process according to any of the preceding claims, characterized in that at least one E_n block contains at least 90% by weight of oxyethylene units.

5. Process according to any of the preceding claims, characterized in that one E_n block is an end block.

6. Process according to any of the preceding claims, characterized in that the calculated OH number of the polyether polyols is from 50 mg KOH/g to 400 mg KOH/g.

7. Process according to any of the preceding claims, characterized in that the polyether polyols, aside from the structural units originating from the starter, consist exclusively of the E_n and P_m blocks.

8. Process according to any of the preceding claims, characterized in that at least one further starter compound having a melting point < 40°C is used in a proportion of up to 30% by weight based on the total mass of all starter compounds.

9. Process according to any of the preceding claims, characterized in that no solvent is used in the reaction of the starter compound with ethylene oxide and propylene oxide and any further alkylene oxide compounds.

10. Process according to any of the preceding claims, characterized in that the catalyst is a basic catalyst.

11. Process according to any of the preceding claims, characterized in that the catalyst is used in a concentration, based on the amount of end product, of 0.004 to 1.0% by weight, especially of 0.05 to 1.0% by weight.

12. Process according to any of the preceding claims, characterized in that the catalyst used is potassium hydroxide.

13. Process according to any of the preceding claims, characterized in that the reaction of the at least one starter compound with ethylene oxide and propylene oxide is effected at temperature of 70 to 170°C, especially of 100 to 160°C.

14. Process according to any of the preceding claims, characterized in that the starter compound used is pentaerythritol, sucrose, trimethylolpropane and/or sorbitol.

15. Polyether polyols preparable by a process according to any of Claims 1 to 14, wherein the polyether polyols at 20°C are, in particular, visually clear and/or homogeneous.

Claims

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characterized in that

the reaction with propylene oxide is effected during the metered addition of the P_m block(s) under the conditions of the following inequation:

$$\frac{x_m(PO)}{x(OH) * t_m(PO) * OHZ} < 0.0060$$

in [g/(h*{mg KOH})](1)

where

x_m(PO) is defined as the molar amount of propylene oxide metered in for the P_m block in mol,

x(OH) is defined as the molar amount of hydroxyl groups in the polyether polyol in mol,

t_m(PO) is defined as the metering time for the propylene oxide of the P_m block in hours,

OHZ is defined as the calculated OH number of the polyether polyol in mg KOH/g, and

m is as defined above,

and where the total content of oxyethylene units in the polyether polyol, based on the total mass of the alkylene oxides metered in, is from 5 to 90% by weight,

and characterized in that

no solvent is used in the reaction of the starter compound with ethylene oxide and propylene oxide and any further alkylene oxide compounds

and characterized in that

the catalyst is a basic catalyst.

2. Process according to Claim 1, characterized in that the P_m block comprises or the P_m blocks comprise at least 75% by weight of oxypropylene units, based on the total mass of the alkylene oxides metered in for this block or these blocks.

3. Process according to either of the preceding claims, characterized in that the polyether polyols contain up to 85% by weight of oxyethylene units, based on the total mass of the alkylene oxides metered in.

4. Process according to any of the preceding claims, characterized in that at least one E_n block contains at least 90% by weight of oxyethylene units.

5. Process according to any of the preceding claims, characterized in that one E_n block is an end block.

6. Process according to any of the preceding claims, characterized in that the calculated OH number of the polyether polyols is from 50 mg KOH/g to 400 mg KOH/g.

7. Process according to any of the preceding claims, characterized in that the polyether polyols, aside from the structural units originating from the starter, consist exclusively of the E_n and P_m blocks.

8. Process according to any of the preceding claims, characterized in that at least one further starter compound having a melting point < 40°C is used in a proportion of up to 30% by weight based on the total mass of all starter compounds.

9. Process according to any of the preceding claims, characterized in that the catalyst is used in a concentration, based on the amount of end product, of 0.004 to 1.0% by weight, especially of 0.05 to 1.0% by weight.

10. Process according to any of the preceding claims, characterized in that the catalyst used is potassium hydroxide.

11. Process according to any of the preceding claims, characterized in that the reaction of the at least one starter compound with ethylene oxide and propylene oxide is effected at temperature of 70 to 170°C, especially of 100 to 160°C.

12. Process according to any of the preceding claims, characterized in that the starter compound used is pentaerythritol, sucrose, trimethylolpropane and/or sorbitol.