Claims

1. A process for preparing polyether carbonate polyols by addition of alkylene oxides and carbon dioxide onto H-functional starter substance in the presence of a double metal cyanide (DMC) catalyst or in the presence of a metal complex catalyst based on the metals zinc and/or cobalt, wherein

   (γ) alkylene oxide and carbon dioxide are added onto H-functional starter substance in a reactor at a total (absolute) pressure of 5 to 120 bar in the presence of a double metal cyanide catalyst or in the presence of a metal complex catalyst based on the metals zinc and/or cobalt to obtain a reaction mixture comprising the polyether carbonate polyol,

   (δ) the reaction mixture obtained in step (γ) remains in the reactor or is optionally transferred continuously into a postreactor at an initial total (absolute) pressure of 5 to 120 bar, wherein the content of free alkylene oxide in the reaction mixture is reduced in each case by way of a postreaction, and wherein the total (absolute) pressure during step (δ) can decrease by up to 50%, and

   (ζ) the content of readily volatile constituents in the reaction mixture obtained is thermally reduced at a temperature of 80°C to 200°C,

   characterized in that

   (ε) prior to step (ζ), the reaction mixture resulting from step (δ) is brought to a total (absolute) pressure of ≤ 2.0 bar and then left at a temperature of 80 to 180°C for a dwell time of at least 0.5 h, and after this dwell time has elapsed 5 to 100 ppm of component K is added to the resulting mixture, where component K is selected from at least one compound containing a phosphorus-oxygen-hydrogen group.

2. The process as claimed in claim 1, wherein, in step (ε), the reaction mixture prior to step (ζ) is left at a temperature of 80 to 180°C for a dwell time of 1.0 h to 20 h, and after this dwell time has elapsed 5 to 100 ppm of component K is added to the resulting mixture.

3. The process as claimed in claim 1, wherein, in step (ε), the reaction mixture prior to step (ζ) is left at a temperature of 80 to 180°C for a dwell time of 1.0 h to 20 h, and after this dwell time has elapsed 5 to 75 ppm of component K is added to the resulting mixture.

4. The process as claimed in claim 1, wherein, in step (ε), the reaction mixture prior to step (ζ) is left at a temperature of 100 to 160°C for a dwell time of 1.0 h to 20 h, and after this dwell time has elapsed 5 to 100 ppm of component K is added to the resulting mixture.

5. The process as claimed in claim 1, wherein, in step (ε), the reaction mixture prior to step (ζ) is left at a temperature of 100 to 160°C for a dwell time of 2.0 h to 10 h, and after this dwell time has elapsed 5 to 75 ppm of component K is added to the resulting mixture.

6. The process as claimed in any of claims 1 to 5, wherein component K, in addition to step (ε), is added during step (δ) at a free alkylene oxide content of 1 g/L to 10 g/L alkylene oxide.

7. The process as claimed in any of claims 1 to 6, wherein prior to step (γ)

(β) activation is accomplished by adding a portion (based on the total amount of the alkylene oxides used in the activation and copolymerization) of alkylene oxide to a mixture of H-functional starter substance and DMC catalyst or to a mixture of suspension medium and DMC catalyst, wherein this addition of the portion of alkylene oxide can optionally be effected in the presence of CO_2, in which case the temperature peak ("hotspot") that occurs owing to the subsequent exothermic chemical reaction and/or a pressure drop in the reactor is awaited in each case, and wherein activation step (β) can also be effected repeatedly.

8. The process as claimed in any of claims 1 to 7, wherein in a first step

(α) the H-functional starter substance or a suspension medium is initially charged and any water and/or other readily volatile compounds are removed by elevated temperature and/or reduced pressure ("drying"), wherein the DMC catalyst is added to the H-functional starter substance or to the suspension medium before or after the drying.

9. The process as claimed in any of claims 1 to 8, wherein in step (γ) alkylene oxide, H-functional starter substance and DMC catalyst are continuously metered into the reactor during the reaction in the presence of carbon dioxide and the resulting reaction mixture is continuously removed from the reactor.

10. The process as claimed in any of claims 1 to 9, wherein component K is selected from at least one compound from the group consisting of
phosphoric acid,
mono- and dialkyl esters of phosphoric acid,
mono- and diaryl esters of phosphoric acid,
mono- and dialkaryl esters of phosphoric acid,
$(NH_4)_2HPO_4$,
phosphonic acid,
monoalkyl esters of phosphonic acid,

monoaryl esters of phosphonic acid,
monoalkaryl esters of phosphonic acid,
phosphorous acid,
mono- and dialkyl esters of phosphorous acid,
mono- and diaryl esters of phosphorous acid,
mono- and dialkaryl esters of phosphorous acid,
phosphinic acid.

11. The process as claimed in any of claims 1 to 10, wherein component K is selected from at least one compound from the group consisting of phosphoric acid, phosphonic acid and phosphinic acid.

12. The process as claimed in any of claims 1 to 11, wherein component K is phosphoric acid.

13. The process as claimed in any of claims 1 to 12, wherein the H-functional starter substance is selected from at least one of the group consisting of ethylene glycol, propylene glycol, propane-1,3-diol, butane-1,3-diol, butane-1,4-diol, pentane-1,5-diol, 2-methylpropane-1,3-diol, neopentyl glycol, hexane-1,6-diol, octane-1,8-diol, diethylene glycol, dipropylene glycol, glycerol, trimethylolpropane, pentaerythritol, sorbitol, polyether carbonate polyols having a molecular weight Mn in the range from 150 to 8000 g/mol with a functionality of 2 to 3, and polyether polyols having a molecular weight Mn in the range from 150 to 8000 g/mol with a functionality of 2 to 3.

14. The process as claimed in any of claims 1 to 13, wherein in step (δ) the reaction mixture obtained in step (γ) is transferred continuously into a postreactor, wherein the postreactor is a tubular reactor.

15. The process as claimed in any of claims 1 to 14, wherein in step (δ) the reaction mixture obtained in step (γ) is transferred continuously into a postreactor, wherein the content of free alkylene oxide is reduced to less than 0.5 g/L by way of postreaction.

16. A polyether carbonate polyol obtainable as claimed in any of claims 1 to 15.