Claims

1. Process for preparing hydroxy-functionalized polydiene, preferably polybutadiene or polyisoprene, by reacting monomer diene with hydrogen peroxide in the presence of a hydrophilic organic solvent, characterized in that the total amount of monomer diene used is added to the reaction in at least two parts, wherein the second part of the monomer diene is added to the reaction at a temperature of the reaction mixture that is at least +5 K different from the temperature of the reaction mixture at the addition of the first part of the monomer diene.

2. Process according to Claim 1, characterized in that the second part of the monomer diene is added to the reaction at least 30 minutes after the addition of the first part of the monomer diene.

3. Process according to any of Claim 1 or 2, characterized in that the first part of the monomer diene is added to the reaction before the addition of hydrogen peroxide and the second part of the monomer diene is added to the reaction after the addition of hydrogen peroxide.

4. Process according to any of Claims 1 to 3, characterized in that it comprises the steps:
   a) heating hydrophilic organic solvent to a temperature of from 75 to 105 °C,
   b) adding the first part of the total amount of monomer diene before the start of, during, or after step a) resulting in a pressure of from 0.1 to 5.0 MPa, preferably 0.5 to 3.0 MPa, most preferably 0.75 to 2.0,
   c) adding the hydrogen peroxide to the mixture,
   d) heating the mixture obtained in step c) to a temperature of from 110 to 150 °C, preferably of from 115 to 130 °C,
   e) adding the second part of the total amount of the monomer diene in step d) while heating or at the final temperature obtained in step d), and keeping the reaction mixture at a temperature equal to or maximal differing +/- 10 K from the temperature obtained in step d),
   f) terminating the reaction.

5. Process according to Claim 4, wherein the adding of the second part of the total amount of the monomer diene in step d) is completed before reaching the final temperature obtained in step d).

6. Process according to any of claims Claim 1 to 5, wherein the hydrophilic organic solvent is an alkanol which is liquid at room temperature, preferably isopropanol or ethanol.

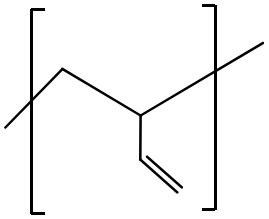
7. Process according to one or more of the preceding claims, wherein the total amount of the hydrophilic organic solvent used is from 15 to 30 % by weight, preferably from 22 to 30 % by weight, that of the monomer diene is from 60 to 80 % by weight, that of water is less than 10 % by weight, preferably from 2 to 8.1 % by weight, and that of the hydrogen peroxide is from 1 to 5 % by weight, each based on the total weight of the reaction mixture.

8. Process according to according to one or more of the preceding claims, wherein the temperature of the reaction mixture in step c) is not less than 100 °C.

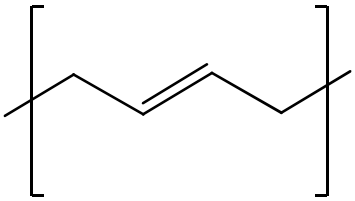
9. Process according to one or more of the preceding claims, wherein the weight ratio of the first part of monomer diene added to the second part of monomer diene added is from 2 to 1 to 1 to 10, more preferably from 1 to 1 to 1 to 8 and most preferably 1 to 3 to 1 to 5.

10. Process according to one or more of the preceding claims, wherein the weight ratio of the total amount of hydrogen peroxide used and the total amount of monomer diene used is from 1 to 10 to 1 to 40, more preferably from 1 to 15 to 1 to 30 and most preferably from 1 to 16 to 1 to 23.

11. Hydroxy-functionalized polybutadiene, having a dispersity index D below 2.7, a viscosity at 30 °C below 3200 mPa*s, an OH-number of from 50 to 90, a number average molecular weight Mn of from 1.6 to 2.5 kDa, and a weight number average molecular weight Mw of from 4.0 to 5.6 kDa, and comprising the monomer units derived from 1,3-butadiene

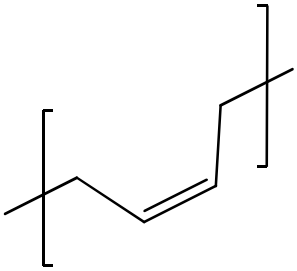


(A)



(B)

and



(C)

wherein the proportion of (A) in the entirety of the 1,3-butadiene-derived monomer units present in the polybutadiene is from 10 to 60 mol %, and wherein the sum of the proportions of (B) and (C) in the entirety of the 1,3-butadiene-derived monomer units present in the polybutadiene is from 40 to 90 mol %.

12. Use of hydroxy-functionalized polybutadiene according to claim 11, for the production of polyurethane-based thermo- or electro-insulation, adhesives or sealants or polyesters, preferably block-co-polyesters.