Table 1

Membrane	Filtered medium	Pressure in MPa	Temperature in °C	Filtration time in min
GE DK	Water	2.0	20	23
	aqueous phase	3.0	20	137
NanoPro™ B-4022	Water	2.0	20	40
	aqueous phase	3.0	20	160
PuraMem® S 600	organic phase	2.0	20	29
		3.0	20	114
ONF-2	organic phase	3.9	83	315

The filtration conditions for determining retention capacity and permeability are listed in Tables 2-5 and the filtration experiments were conducted at a stirring speed of 500 min^{-1}. The concentrations of tungsten and nitrogen in the phase used (feed), in the retentate and in the permeate and the retention capacity for tungsten and phase transfer catalyst calculated therefrom are listed in Tables 6 and 7. The retention capacity was calculated as 1 - (permeate concentration)/(retentate concentration) at each given time point.

Patent claims:

1. Process for preparing 1,2-propanediol from propene and hydrogen peroxide comprising the steps of
   a) reacting propene (1) with hydrogen peroxide (2) in the presence of a catalyst mixture (3) comprising a phase transfer catalyst and a heteropolytungstate, wherein the reaction is carried out in a liquid mixture (6) comprising an aqueous phase having a pH of at most 6 and an organic phase,
   b) separating the biphasic mixture (6) from step a) into an aqueous phase P1 (8) and an organic phase P2 (9) comprising propene oxide,
   c) recycling the propene oxide present in the separated organic phase P2 (9) into the reaction of step a) and
   d) separating 1,2-propanediol (20) from the aqueous phase P1 (8) separated in step b).

2. Process according to Claim 1, characterized in that the heteropolytungstate present in the organic phase P2 (9) separated in step c) is recycled into the reaction of step a).

3. Process according to Claim 1 or 2, characterized in that the pH of the aqueous phase in step a) is maintained in the range of 1.0 to 3.5, preferably 2.0 to 3.0.

4. Process according to any of Claims 1 to 3, characterized in that the aqueous phase P1 (8) is separated by nanofiltration (10) in step d) into a retentate (11) enriched in heteropolytungstate and a permeate (12) depleted in heteropolytungstate, the retentate (11) is recycled into the reaction of step a) and 1,2-propanediol (20) is separated from the permeate (12).

5. Process according to any one of Claims 1 to 4, characterized in that the reaction in step a) is carried out in the presence of at least one solvent having a boiling point of more than 100°C and a water solubility at 20°C of less than 250 mg/kg.

6. Process according to Claim 5, characterized in that the solvent comprises an epoxidized fatty acid methyl ester.

7. Process according to Claim 5, characterized in that the solvent comprises an alkylated aromatic hydrocarbon having 8 to 12 carbon atoms.

8. Process according to any one of Claims 1 to 7, characterized in that the organic phase P2 (9) separated in step b) is completely or partly recycled into the reaction of step a).

9. Process according to any one of Claims 1 to 8, characterized in that the organic phase P2 (9) is separated completely or partly by nanofiltration (24) in step c) into a retentate (25) enriched in heteropolytungstate and a permeate (26) depleted in heteropolytungstate and the retentate (25) is recycled into the reaction of step a).

10. Process according to Claim 9, characterized in that the organic phase P2 (9) is separated by nanofiltration (24) into the retentate (25) enriched in heteropolytungstate and the permeate (26) depeleted in heteropolytungstate, a stream S1 (28) comprising unreacted