Claims:

1. A method for the preparation of 1,2-propanediol comprising the steps:
   a) reacting propene with hydrogen peroxide at a temperature of from 50 to 110 °C in the presence of a catalyst mixture comprising a phase transfer catalyst and a heteropolytungstate in a liquid reaction mixture comprising an aqueous phase with a maximum apparent pH of 6 and an organic phase comprising an alkylaromatic hydrocarbon solvent;
   b) separating the reaction mixture obtained in step a) into an aqueous phase (P_a) comprising 1,2-propanediol and an organic phase (P_o) comprising non-reacted propene, the alkylaromatic hydrocarbon solvent and dissolved oxygen from hydrogen peroxide decomposition;
   c) contacting the organic phase (P_o) separated in step b) with a stream of a non-flammable gas at a flow rate of non-flammable gas, a temperature and a pressure effecting desorption of from 10 to 75 % of the oxygen dissolved in the organic phase (P_o) into the stream of non-flammable gas, providing an oxygen depleted organic phase (P_d) and an off-gas comprising the non-flammable gas and desorbed propene and oxygen;
   d) recycling at least a part of the oxygen depleted organic phase (P_d) to the reaction step a); and
   e) recovering 1,2-propanediol from the aqueous phase (P_a);

   wherein the mass ratio of alkylaromatic hydrocarbon solvent introduced to step a) to hydrogen peroxide introduced to step a) is from 4:1 to 30:1 and steps a) and b) are carried out in vessels flooded by the liquid reaction mixture at a pressure high enough to suppress desorption of gas from the liquid reaction mixture.

2. The method of claim 1, wherein steps a) to d) are carried out continuously.

3. The method of claim 2, wherein in step a) the concentration of hydrogen peroxide in the aqueous phase is from 0.1 to 5 % by weight.

4. The method of any one of claims 1 to 3, wherein the molar ratio of propene introduced to step a) to hydrogen peroxide introduced to step a) is from 1.2:1 to 5:1, preferably 1.5:1 to 3:1.

5. The method of any one of claims 1 to 4, wherein the alkylaromatic hydrocarbon solvent comprises more than 50 % by weight and preferably more than 80 % by weight of alkylated aromatic hydrocarbons having from 7 to 12 carbon atoms.

6. The method of any one of claims 1 to 5, wherein in step c) the non-flammable gas is passed through the organic phase (P_o).

7. The method of any one of claims 1 to 6, wherein in step c) the desorption is carried out with counter current flow of non-flammable gas and organic phase (P_o).

8. The method of any one of claims 1 to 7, wherein in step c) the flow rate of non-flammable gas, the temperature and the pressure are adjusted to provide an oxygen concentration in the off-gas of from 1 to 11 mol-%.

9. The method of any one of claims 1 to 8, wherein nitrogen is used as the non-flammable gas.

10. The method of any one of claims 1 to 9, wherein step a) is carried out with a propene feedstock containing from 1 to 8 mol-% of propane and in step c) the flow rate of non-flammable gas, the temperature and the pressure are adjusted to provide an off gas with a mass ratio of propane to the combined amount of propane and propene of from 0.2 to 0.7.

11. The method of any one of claims 1 to 10, wherein step a) is conducted continuously in a loop reactor comprising fixed internals in a tubular section and the liquid reaction mixture is passed through the reactor at a flow rate sufficient to provide turbulent flow at said internals.

12. The method of any one of claims 1 to 11, wherein the heteropolytungstate is a polytungstophosphate.

13. The method of any one of claims 1 to 12, wherein the phase transfer catalyst is selected from tertiary amines and tertiary or quaternary ammonium salts and comprises in total at least 12 carbon atoms.

14. The method of claim 13, wherein the phase transfer catalyst comprises a tertiary or quaternary ammonium ion having the structure $R^1R^2R^3NR^{4+}$, wherein R^1, R^2 and R^3 are the same or different and are each selected from alkyl groups having from 8 to 10 carbon atoms and R^4 is hydrogen or methyl.