CLAIMS

1. A process for producing renewable fuel components, said process comprising the steps of

    a. providing a glyceride containing feedstock; and

    b. splitting said glyceride containing feedstock to provide a first stream comprising fatty acids, or esters of fatty acids, and a second stream comprising glycerol and water; and

    c. subjecting said second stream obtained from step b, to

        i. at least one evaporation in the presence of 5-50 %-wt water of the total second stream weight, wherefrom the vapor phase is directed to;

        ii. catalytic conversion of glycerol to 1-propanol, 2-propanol or a mixture thereof at vapor phase in presence of water and hydrogen, and

        iii. separation and recovery of 1-propanol, 2-propanol or a mixture thereof as a renewable propanol gasoline component;

    d. subjecting said first stream to hydroprocessing, to provide a first product stream of renewable paraffinic fuel components comprising i-paraffins and n-paraffins, and

    e. separating said first product stream, and recovering renewable fuel components comprising at least one renewable paraffinic naphtha component.

2. The process according to claim 1 for producing renewable fuel components, said process comprising

    a. providing a glyceride containing feedstock; and

    b. splitting said glyceride containing feedstock to provide a first stream comprising fatty acids, or esters of fatty acids, and a second stream comprising glycerol and water; and

    b’. separating the first stream obtained from step b into at least two fatty acid or fatty acid ester fractions, fraction 1 and fraction 2, and

c. subjecting said second stream obtained of step b, and optionally added water to

i. at least one evaporation in the presence of 5-90 %-wt water of the total second stream weight, wherefrom the vapor phase is directed to;

ii. catalytic conversion of glycerol to 1-propanol, 2-propanol or a mixture thereof at vapor phase in presence of water and hydrogen, and

iii. separation and recovery of 1-propanol, 2-propanol or a mixture thereof as a renewable propanol gasoline component;

d. subjecting fraction 1 to hydroprocessing to provide a first product stream of renewable paraffinic fuel components comprising i-paraffins and n-paraffins

d'. subjecting fraction 2 to ketonisation prior to hydroprocessing to provide a second product stream containing paraffinic renewable base oil comprising i-paraffins and n-paraffins; and

e. separating and recovering from the second product stream or combined first and second product streams, renewable fuel component(s) comprising at least one renewable paraffinic naphtha component.

3. The process according to one of claim 2, wherein separation in step b' comprises distillation.

4. The process according to one of claims 2 or 3, wherein more than 70 %-wt of the total weight of fraction 1 consists of C18-fatty acids or fatty acid esters.

5. The process according to one of claims 2 - 4, wherein more than 70 %-wt of the total weight of fraction 2 consists of C16-fatty acids or fatty acid esters.

6. The process according to one of the preceding claims, wherein an aqueous residue is withdrawn from the evaporation (i).

7. The process according to one of the preceding claims, wherein the catalytic glycerol conversion (ii) is conducted at a temperature below 400 °C.

8. The process according to one of the preceding claims, wherein the catalytic glycerol conversion (ii) and at least one separation step (iii) for recovery of 1-propanol, 2-propanol or a mixture thereof are conducted at a pressure between 0.2 and 1.5 MPa.

9. The process according to claim 8, wherein the separation step (iii) comprises at least one distillation.

10. The process according to one of the preceding claims, wherein the hydroprocessing of step d, or d', or both d and d', comprises hydrodeoxygenation.

11. The process according to claim 10, wherein the hydrodeoxygenation is conducted at reaction conditions comprising a temperature in the range from 100 to 500 °C,; and at a pressure in the range from 0.1 to 20 MPa.

12. The process according to claim 10, wherein the hydrodeoxygenation is conducted at the weight hourly space velocity (WHSV) in the range from 0.5 to 3.0 h^{-1}.

13. The process according to claim 10, wherein the hydrodeoxygenation is conducted at H_2 flow in the range from 350 to 900 nl H_2/l feed, more preferably from 350 to 750, most preferably from 350 to 500, wherein nl H_2/l means normal liters of hydrogen per liter of the feed into the HDO reactor, in the presence of a hydrodeoxygenation catalyst selected from Pd, Pt, Ni, Co, Mo, Ru, Rh, W, or any combination of these, such as CoMo, NiMo, NiW, CoNiMo on a support, wherein the support is preferably alumina and/or silica.

14. The process according to one of the preceding claims, wherein the hydroprocessing of step d, or d', or both d and d', comprises hydroisomerisation.

15. The process according to claim 14, wherein the hydroisomerization is performed at a temperature from 250 to 400 °C, more preferably from 280 to 370 °C, most preferably from 300 to 350 °C, and at pressure from 1 to 6 MPa, more preferably from 2 to 5 MPa, most preferably from 2.5 to 4.5 MPa.

16. The process according to claim 14, wherein the hydroisomerization is conducted at the WHSV is from 0.5 to 2 h^{-1}.

17. The process according to claim 14, wherein the hydroisomerization is conducted at H_2 flow from 100 to 800, more preferably from 200 to 650, most preferably from 350 to 500 n-liter H_2/liter feed, in the presence of an hydroisomerization catalyst selected from noble metal bifunctional catalysts, preferably Pt containing commercial catalysts, more preferably from Pt-SAPO or Pt-ZSM-catalyst or a non-noble catalyst, such as NiW.

18. The process according to claims 10 and 14 wherein hydrodeoxygenation and hydroisomerization are performed simultaneously using NiW catalyst.

19. The process according to one of the preceding claims, wherein step e further comprises recovery of at least one further component selected from renewable paraffinic diesel fuel component, renewable paraffinic aviation fuel component and renewable transformer oil.

20. The process according to one of the preceding claims, further comprising blending the renewable paraffinic naphtha component with the renewable propanol gasoline component.

21. A renewable propanol gasoline component comprising 1-propanol, 2-propanol or a mixture thereof wherein the ratio of 2-propanol to 1-propanol ranges from 0.15 to 0.99.

22. A renewable propanol gasoline component comprising 1-propanol, 2-propanol or a mixture thereof wherein the ratio of 2-propanol to 1-propanol ranges from 0.2 to 0.6.

23. The component according to claim 21 comprising from 14 to 49 %-wt 2-propanol, from 50 to 85 %-wt 1-propanol and from 0.2 to 5 wt-% of an impurity selected from methanol, ethanol, acetol, acetone, 1,2-propanediol, 1,3-propanediol and mixtures thereof and wherein sum of 2-propanol, 1-propanol and said impurities adds up to 100 %-wt of the renewable propanol gasoline component weight.

24. A composition comprising the renewable propanol gasoline component according to one of claims 21 – 23 further comprising a renewable paraffinic naphtha component.

25. The composition according to claim 24 wherein the renewable paraffinic naphtha component comprises the renewable paraffinic naphtha component recovered in step e.

26. The composition according to claim 24 or 25 comprising 1-propanol, 2-propanol or a mixture thereof in an amount from 6 to 15 %-wt of the total weight of the composition.

27. The composition according to one of claims 24 - 26 comprising renewable paraffinic naphtha component from 7 to 94 %-wt of the total weight of the composition.

28. The composition according to one of claims 24 – 27, wherein renewable paraffinic naphtha component comprises essentially a mixture of C4-C9 hydrocarbons, or the renewable paraffinic naphtha component consists of C4-C8-alkanes.

29. The composition according to one of claims 24 – 28, wherein renewable paraffinic naphtha component comprises 10-40 %-wt of a mixture of C4-C9 n-alkanes, 30-80 %-wt of a mixture of C4-C9 isoalkanes, 2-15 %-wt of a mixture of C4-C9 cycloalkanes, no more than 1 %-wt of alkenes, no more than 1 %-wt of aromatic hydrocarbons and no more than

0.5 %-wt in total of oxygen containing compounds, wherein the total amount C4-C9 n-alkanes, C4-C9 isoalkanes and C4-C9 cycloalkanes is at least 95 %-wt of the total renewable paraffinic naphtha component weight.

30. The composition according to one of claims 24 – 29, wherein the renewable paraffinic naphtha component has a boiling point in range of about 40 °C to 170 °C at normal pressure.

31. The composition according to one of claims 24 - 30 consisting of renewable 1-propanol, 2-propanol or a mixture thereof and a renewable paraffinic naphtha component, wherein 100 %-wt of the total gasoline weight is of renewable origin.

32. The composition according to one of claims 24 – 30, further comprising a fossil gasoline component.

33. The composition according to claim 32, wherein the fossil gasoline component comprises essentially a mixture of organic compounds, said mixture having a boiling point in the range from 30 °C to 230 °C.

34. The composition according to claim 32 or 33, wherein the fossil gasoline component comprises essentially a combination of hydrocarbons comprising paraffinic, aromatic and olefinic hydrocarbons, having from 4 to 9 carbon atoms.

35. The composition according to one of claims 32 - 34, wherein the olefinic content is about 20 vol% and the aromatic content about 40 vol% of the fossil gasoline component.

36. Use of a renewable propanol gasoline component according to one of claims 21 – 23 or a composition according to one of claims 24 - 35 as a gasoline component.

37. The use according to claim 36 for combined fuel component production according to a process of one of claims 1-20.

38. A process for converting glycerol to 1-propanol, 2-propanol or a mixture thereof, by a catalytic conversion at a vapor phase in the presence of water at a pressure between 0.2 and 1.5 MPa, in the presence of a catalyst comprising metal selected from Pt, Pd, Ni, Cr, Mo, W, Ru, Rh, Ir, Cu on an acid oxide support, wherein a feed comprising glycerol and 5-90 %-wt of water of the total feed weight, is subjected to evaporation wherefrom a vapor phase is conducted to said catalytic conversion.

39. The process according to claim 38, wherein an aqueous residue is withdrawn from the evaporation.

40. The process according to one of claims 38 or 39, wherein the conversion is conducted at a temperature below 400 °C,.

41. The process according to one of claims 38 - 40, wherein at least one separation step following said conversion for recovery of 1-propanol, 2-propanol or a mixture thereof is conducted at a pressure between 0.2 and 1.5 MPa.

42. The process according to one of claims 38 - 41, wherein the feed 5-50 %-wt and preferably 5-30 %-wt of water of the total feed weight.

43. The process according to one of claims 38 - 42, wherein the glycerol is obtained from hydrolysis of triglycerides.

44. The process according to claim 43, wherein the feed further comprises crude glycerol.