i) passing a feedstock originating from a renewable source through a hydroprocessing step for producing a main hydrotrotreated stream; said hydroprocessing step comprising:

- passing the feedstock through one or more catalytic hydrotreating units under the addition of hydrogen for producing a first hydrotreated stream, said hydrotreated stream comprising the impurities: $H_2S$, $NH_3$, CO, $CO_2$ and $H_2O$;
- passing the first hydrotreated stream to a first separation step comprising the use of a separation unit, for removing the impurities;
- withdrawing from said first separation step an overhead stream and separating an overhead hydrocarbon liquid stream thereof of which the entire portion is passed as a reflux stream to said first separation unit;
- withdrawing from said first separation step a bottom stream;
- passing at least a portion of said bottom stream to a dewaxing step comprising the use of one or more catalytic hydrotreating units under the addition of hydrogen for producing said main hydrotreated stream;

ii) passing the main hydrotreated stream to a second separation step for producing said hydrocarbon product;

wherein the one or more catalytic hydrotreating units for producing said first hydrotreated stream comprises hydrodeoxygenation (HDO) and optionally also hydrodenitrification (HDN);

wherein the one or more catalytic hydrotreating units in the dewaxing step for producing said main hydrotreated stream comprises hydrodewaxing (HDW) under the presence of a noble metal catalyst, and optionally also hydrocracking (HCR);

and wherein the process further comprises:

separating an overhead gaseous stream comprising the impurities from said overhead stream from the first separation step, and passing said overhead gaseous stream to a separator of said second separation step.

## Description

Accordingly, the present invention provides a process for producing a hydrocarbon product, said process comprising:

CLAIMS

1. A process for producing a hydrocarbon product, said process comprising:
i) passing a feedstock originating from a renewable source through a hydroprocessing step for producing a main hydrotrotreated stream; said hydroprocessing step comprising:
- passing the feedstock through one or more catalytic hydrotreating units under the addition of hydrogen for producing a first hydrotreated stream, said hydrotreated stream comprising the impurities: $H_2S$, $NH_3$, CO, $CO_2$ and $H_2O$;
- passing the first hydrotreated stream to a first separation step comprising the use of a separation unit, for removing the impurities;
- withdrawing from said first separation step an overhead stream and separating an overhead hydrocarbon liquid stream thereof of which the entire portion is passed as a reflux stream to said first separation unit;
- withdrawing from said first separation step a bottom stream;
- passing at least a portion of said bottom stream to a dewaxing step comprising the use of one or more catalytic hydrotreating units under the addition of hydrogen for producing said main hydrotreated stream;
ii) passing the main hydrotreated stream to a second separation step for producing said hydrocarbon product;
wherein the one or more catalytic hydrotreating units for producing said first hydrotreated stream comprises hydrodeoxygenation (HDO) and optionally also hydrodenitrification (HDN);
wherein the one or more catalytic hydrotreating units in the dewaxing step for producing said main hydrotreated stream comprises hydrodewaxing (HDW) under the presence of a noble metal catalyst, and optionally also hydrocracking (HCR);
and wherein the process further comprises:
separating an overhead gaseous stream comprising the impurities from said overhead stream from the first separation step, and passing said overhead gaseous stream to a separator of said second separation step.

2. The process according to claim 1, wherein step ii) comprises passing said main hydrotreated stream to said separator for producing an aqueous stream (sour water stream), a hydrogen-rich stream, and a hydrocarbon stream which is further separated into said hydrocarbon product in a subsequent stripping section; and wherein said hydrogen-rich stream is supplied as a single recycle loop in the process by adding it to the one or more catalytic hydrotreating units for producing said first hydrotreated stream.

3. The process according to claim 2, wherein said separator is a cold separator.

4. The process according to claim 2 or 3, further comprising: not adding the hydrogen-rich stream to the dewaxing step; adding a make-up hydrogen gas, e.g. from outside sources, to the dewaxing step, and after passing it through the dewaxing step, mixing it with the hydrogen-rich stream thus generating a mixed hydrogen stream, which is then supplied as said single recycle loop.

5. The process according to claim 2 or 3, further comprising: passing said overhead gaseous stream after mixing it with said main hydrotreated stream and by subsequently cooling in e.g. an air cooler, to said separator in step ii).

6. The process according to any of claims 1-5, wherein said hydrocarbon product boils at above 30°C and comprises one or more of: jet fuel, diesel, naphtha and optionally also lube base stock.

7. The process according to any of claims 1-6, wherein in the first separation step, the separation unit is a high-pressure stripper in the form of a stripping column using make-up hydrogen gas as stripping medium and operating in the pressure range 40-70 barg and temperature range 150-250°C.

8. The process according to any of claims 1-7, wherein the first separation step further comprises using a hot separator upstream the separation unit in the form of a two-phase or three-phase vertical or horizontal separator with a gas stream from the top and a liquid stream from the bottom, running at a temperature above 100°C, whereby water is removed as vapor in said gas stream.

9. The process according to any of claims 1-8, wherein in step i) a recycle oil stream is divided from said bottom stream and passed to the one or more catalytic hydrotreating units upstream.

10. The process according to any of claims 1-9, wherein the feedstock originating from a renewable source is obtained from a raw material of renewable origin, such as originating from plants, algae, animals, fish, vegetable oil refining, domestic waste, waste rich in plastic, industrial organic waste like tall oil or black liquor, or a feedstock derived from one or more oxygenates taken from the group consisting of triglycerides, fatty acids, resin acids, ketones, aldehydes or alcohols where said oxygenates originate from one or more of a biological source, a gasification process, a pyrolysis process, Fischer-Tropsch synthesis, or methanol based synthesis.

11. The process according to any of claims 1-10, wherein the feedstock further originates from a fossil fuel source which is selected from diesel, kerosene, naphtha, and vacuum gas oil (VGO).

12. The process according to any of claims 1-11 wherein the feedstock originates from a renewable source and from a fossil source, and wherein the fossil source represents a minor portion thereof amounting to up to 30 wt% or less of the feedstock, such as up to 10 wt%.