CLAIMS

1. A method of purifying a recycled or renewable organic material (10), wherein the recycled or renewable organic material (10) comprises more than 1 ppm silicon as silicon compounds, comprising the steps of

(a) providing the recycled or renewable organic material (10);

(b) heat treating (20) the recycled or renewable organic material (10) in a pressure from 500 to 5000 kPa to form a heat treated recycled or renewable organic material, wherein the at least part of silicon compounds present in the recycled or renewable organic material are converted to volatile silicon compounds, ~~and~~

(c) evaporating volatile silicon compounds (30) from the heat treated recycled or renewable organic material,

to obtain

(i) a vapor fraction (32) comprising the major part of volatile silicon compounds, and (ii) a heat treated recycled or renewable organic material fraction (31) comprising less silicon than the recycled or renewable organic material provided in step (a),and ~~.~~

~~2. A method as claimed in claim 1, wherein the method further comprises~~ ,(d) hydrotreating (40) the heat treated recycled or renewable organic material fraction (31) in a presence of a hydrotreating catalyst to obtain purified recycled or renewable organic material (41).

2~~3~~. ~~A~~The method as claimed in claim 1~~2~~, wherein the purified recycled or renewable organic material (41) comprises less silicon than the recycled or renewable organic material provided in step (a) preferably recycled or renewable organic material comprises less than 20%, more preferably less than 10%, even more preferably less than 5%, of the original silicon content of the recycled or renewable organic material provided in step (a).

~~4. A method as claimed in claim 2 or 3, wherein hydrotreating (40) step (d) takes place under continuous hydrogen flow.~~

~~5. A method as claimed in claim 4, wherein in step (d) the continuous hydrogen flow has H2/feed ratio from 500 to 2000 n-L/L, preferably from 800 to 1400 n-L/L.~~

~~6. A method as claimed in any one of claims 2 to 5, wherein step (d) is performed at a temperature from 270 to 380°C, preferably from 275 to 360°C, more preferably from 300 to 350°C.~~

~~7. A method as claimed in any one of claims 2 to 6, wherein step (d) is performed under pressure from 4 to 20 MPa.~~

~~8. A method as claimed in any one of claims 2 to 7, wherein the hydrotreating catalyst in step (d) comprises at least one component selected from IUPAC group 6, 8 or 10 of the Periodic Table.~~

~~9. A method as claimed in any one of claims 2 to 8, wherein the hydrotreating catalyst in step (d) is a supported Pd, Pt, Ni, NiW, NiMo or a CoMo catalysts and the support is zeolite, zeolite-alumina, alumina and/or silica, preferably NiW/Al_2O_3, $NiMo/Al_2O_3$ or $CoMo/Al_2O_3$.~~

3~~10~~. A~~The~~ method as claimed in claim 1~~2~~, wherein step (d) is accomplished by (d1) hydrodeoxygenating (HDO) the heat treated recycled or renewable organic material fraction (31).

~~11. A method as claimed in claim 10, wherein step (d1) is performed in a presence of a HDO catalyst at 290 to 350°C under pressure from 4 to 20 MPa and under continuous hydrogen flow.~~

~~12. A method as claimed in claim 10, wherein step (d1) is accomplished by (d1) hydrodeoxygenating (HDO) the heat treated recycled or renewable organic material fraction (31) in a presence of a HDO catalyst at a temperature from 290 to 350°C under pressure from 4 to 20 MPa and under continuous hydrogen flow to obtain purified recycled or renewable organic material (41) comprising less than 1 wt% of oxygen and less than 20%, preferably less than 10 %, more preferably less than 5%, of the original silicon content of the recycled or renewable organic material (10) provided in step (a).~~

~~13. A method as claimed in claim 11 or 12, wherein in step (d1) the HDO catalyst is sulfided NiW, NiMo or CoMo catalyst.~~

~~14. A method as claimed in any one of claim 11 to 13, wherein in step (d1) the continuous hydrogen flow has H2/feed ratio from 500 to 2000 n-L/L, preferably from 800 to 1400 n-L/L.~~

4~~15~~. A~~The~~ method as claimed in any one of claims 1 to 3~~14~~, wherein step (b) is performed at 180 to 325°C, preferably at 200 to 300°C, more preferably at at 240 to 280°C.

5~~16~~. A~~The~~ method as claimed in any one of claims 1 to 4~~15~~, wherein the residence time, is from 1 to 300 min, preferably from 5 to 90 min, more preferably from 20 to 40 min in step (b).

6~~17~~. The~~A~~ method as claimed in any one of claims 1 to 5~~16~~, wherein the pressure in step (b) is from 800 to 2000 kPa.

7~~18~~. ~~A~~The method as claimed in any one of claims 1 to 6~~17~~, wherein step (c) is performed at from 145 to 250°C, preferably from 150°C to 225°C, more preferably at from 160°C to 200°C, even more preferably at 160 to 180°C.

8~~19~~. ~~A~~The method as claimed in any one of claims 1 to 7~~18~~, wherein the pressure in step (c) is 0.1 to 5 kPa, preferably from 0.1 to 3 kPa.

9~~20~~. ~~A~~The method as claimed in any one of claim 1 to 8~~19~~, wherein in step (c) from 1 to 10 wt%, preferably from 1 to 8 wt%, more preferably from 1 to 5 wt%, even more preferably from 1 to 3 wt%, of the heat treated recycled or renewable organic material is evaporated.

10~~21~~. ~~A~~The method as claimed in any one of claim 1 to 9~~20~~, wherein water is added to the heat treated recycled or renewable organic material so that the water content of the heat treated recycled or renewable material before evaporation step (c) is from 1 to 5 wt%, preferably from 1.5 to 4 wt%, more preferably from 2 to 3 wt%.

11~~22~~. ~~A~~The method as claimed in any one of claims 1 to 10~~21~~, wherein after step (c) silicon content of the heat treated recycled or renewable organic material fraction (31) is less than 50 %, preferably less than 30%, of the original silicon content of the recycled or renewable organic material provided in step (a).

12~~23~~. ~~A~~The method as claimed in any one of claims 1 to 11~~22~~, wherein the recycled or renewable organic material (10) is selected from a group consisting of plant based fats and oils, animal based fats and oils, fossil waste-based oils, waste oils, algal oils and microbial oils.

13~~24~~. ~~A~~The method as claimed in any one of claims 1 to 12~~23~~, wherein the recycled or renewable organic material (10) is selected from a group consisting of crude tall oil (CTO), tall oil pitch (TOP), crude fatty acid (CFA), tall oil fatty acid (TOFA) and distilled tall oil (DTO); more particularly the recycled or renewable organic material is crude tall oil (CTO) or tall oil pitch (TOP).

14~~25~~. ~~A~~The process for producing recycled or renewable hydrocarbons, comprising steps of

(x) purifying the recycled or renewable organic material as claimed in any one of claims 1 to 13~~24~~, and

(y) subjecting the purified recycled or renewable organic material to a oil refinery conversion process, wherein the oil refinery conversion process comprises altering the molecular weight of the feed, removal of heteroatoms from the feed, altering the degree of saturation of the feed, rearranging the molecular

structure of the feed, or any combination thereof to obtain at least one recycled or renewable hydrocarbon.

~~26. A process as claimed in claim 25 wherein step (y) is hydrocracking.~~

~~27. A process as claimed in claim 26, wherein step (y) is performed in a mild hydrocracking (MHC) refinery unit.~~

~~28. A process as claimed in claim 26 or 27, wherein step (y) is performed in a presence of a hydrocracking catalyst.~~

~~29. A process as claimed in claim 25 wherein step (y) is steamcracking.~~

~~30. A process as claimed in claim 25 wherein step (y) is isomerization.~~

~~31. A process as claimed in claim 25 wherein step (y) is hydrotreating.~~

~~32. A process as claimed in claim 25 wherein step (y) is thermal catalytic cracking.~~

~~33. A process as claimed in claim 25 wherein step (y) is fluid catalytic cracking.~~