Claims

1. A method for upgrading liquefied waste plastics, the method comprising:

a **step (A)** of providing liquefied waste plastics (LWP) material,

a **step (B)** comprising pre-treating the liquefied waste plastics material by contacting the liquefied waste plastics material with an aqueous medium having a pH of at least 7 at a temperature of 200°C or more, followed by liquid-liquid separation, to produce a pre-treated liquefied waste plastics material,

a **step (C)** comprising hydrotreating the pre-treated liquefied waste plastics material, optionally in combination with a co-feed, to obtain a hydrotreated material, and

a **step (D)** of post-treating the hydrotreated material to obtain a steam cracker feed,

wherein step (D) comprises blending the hydrotreated material with a paraffinic material, and fractionation or separation; and/or

wherein step (D) comprises blending the hydrotreated material with a paraffinic material, wherein the paraffinic material has a naphthenes content in the range of 0.01-15.00 wt.-%.

2. The method according to claim 1, wherein the pre-treated liquefied waste plastics material has a chlorine content of 5 wt.-ppm or more, 10 wt.-ppm or more, 15 wt.-ppm or more, or 20 wt.-ppm or more, and/or wherein the pre-treated liquefied waste plastics material has an olefins content of 10 wt.-% or more, 15 wt.-% or more, 20 wt.-% or more, 30 wt.-% or more, 40 wt.-% or more, or 50 wt.-% or more.

3. The method according to any one of the preceding claims, wherein the pre-treated liquefied waste plastics material has a silicon content of 500 wt.-ppm or less, 300 wt.-ppm or less, or 200 wt.-ppm or less.

4. The method according to any one of the preceding claims, wherein the aqueous medium having a pH of at least 7 is an alkaline aqueous medium comprising water and an alkaline substance dissolved in the water, and

preferably comprises a metal hydroxide dissolved in water, wherein the metal hydroxide is preferably a hydroxide of an alkali metal and/or a hydroxide of an alkaline earth metal, more preferably a hydroxide of an alkali metal.

5. The method according to any one of the preceding claims, wherein the aqueous medium comprises at least 0.3 wt.-% of a metal hydroxide, preferably at least 0.5 wt.-%, at least 1.0 wt.-%, or at least 1.5 wt.-% of a metal hydroxide.

6. The method according to any one of the preceding claims, wherein contacting the liquefied waste plastics material with an aqueous medium having a pH of at least 7 in the pre-treatment step (B) is carried out at a temperature of 210°C or more, preferably 220°C or more, 240°C or more or 260°C or more.

7. The method according to any one of the preceding claims, wherein the steam cracker feed has an olefins content of 5.0 wt.-% or less, preferably 4.0 wt.-% or less, 3.5 wt.-% or less, 3.0 wt.-% or less, 2.5 wt.-% or less, 2.0 wt.-% or less, 1.0 wt.-% or less, 0.5 wt.-% or less, or 0.3 wt.-% or less.

8. The method according to any one of the preceding claims, wherein the liquefied waste plastics (LWP) material provided in step (A) is a fraction of liquefied waste plastics.

9. The method according to any one of the preceding claims, wherein the hydrotreatment in step (C) is carried out in the presence of a hydrotreating catalyst, wherein the hydrotreating catalyst in step (C) is preferably a supported NiMo catalyst or a supported CoMo catalyst and the support comprises alumina and/or silica, the catalyst more preferably being $NiMo/Al_2O_3$ or $CoMo/Al_2O_3$.

10. The method according to any one of the preceding claims, wherein the paraffinic material has a paraffin content of 60 wt.-% or more, preferably 65 wt.-% or more, 70 wt.-% or more, 75 wt.-% or more, 80 wt.-% or more, 85 wt.-% or more, or 90 wt.-% or more, and wherein the paraffinic material is preferably a renewable material.

11. The method according to any one of the preceding claims, wherein the separation in step (D) comprises gas-liquid separation.

12. The method according to any one of the preceding claims, further comprising a step (D') of washing the gaseous effluent from the hydrotreatment step (C) with an acidic liquid medium, wherein the acidic liquid medium is preferably a solution of an acidic substance in a solvent, more preferably a solution of an acidic substance in water, and wherein the acidic substance is preferably an inorganic acidic substance, such as HCl, H_2SO_2, H_2SO_3, HNO_3, H_3PO_4, H_3PO_3, or H_3PO_2 or a mixture thereof, or the acidic substance is preferably an organic acidic substance, more preferably a carboxylic acid, such as acetic acid or formic acid.

13. The method according to any one of the preceding claims, further comprising a step (E) of subjecting the steam cracker feed to steam cracking.

14. A mixture of hydrocarbons obtainable by the method according to any of the claims 1 to 12.

15. Use of the mixture of hydrocarbons according to claim 14 for producing chemicals and/or polymers, such as polypropylene and/or polyethylene.