Claims

1. A method, comprising:

providing a liquefied waste plastic (LWP) feedstock for heat treatment ,HT processing, with an aqueous solution containing a basic substance,

subjecting the LWP feedstock to the heat treatment with the aqueous solution, followed by phase separation to result in at least a treated LWP material and an aqueous phase, wherein the HT processing is carried out at a temperature of 150°C or more,

characterized in that the method comprises

determining the quality of the LWP feedstock by measuring at least one property of the LWP feedstock, the at least one property including at least the total acid number (TAN) of the LWP feedstock, and

calculating an amount of the basic substance that needs to be added in HT processing to reach a target pH level of the aqueous phase based on the at least one property of the LWP feedstock and the water-oil-ratio, the water-oil-ratio being the mixing ratio between the aqueous solution and the LWP feedstock, and adding the calculated amount of basic substance in the form of aqueous solution to be in contact with the LWP feedstock.

2. The method according to claim 1, wherein the target pH level is pH 10.0 or more.

3. The method according to claim 1 or 2, wherein the method further comprises a step of repeatedly readjusting the amount of the basic substance in the form of the aqueous solution to reach the target pH level of the aqueous phase.

4. The method according to any one of the preceding claims, wherein the at least one property of the LWP feedstock includes both the total acid number (TAN) and the total chlorine content of the LWP feedstock.

5. The method according to any one of the preceding claims, wherein the amount of the basic substance is adjusted by modifying the concentration of the basic substance in the aqueous solution employed in HT processing.

6. The method according to any one of the preceding claims, wherein the LWP feedstock has a total acid number (TAN) in the range of 0.1 to 100.0 mgKOH/g, such as 0.2 to 95.0 mgKOH/g, 0.3 to 90 mg KOH/g or more ; 1.0 to 80 mg KOH/g, 3.0 to 60 mg KOH/g, 5.0 to 50.0 mg KOH/ g, 7.0 to 30.0 mg KOH/g, or 9.0 to 20.0 mg KOH/g.

7. The method according to any one of the preceding claims, wherein the basic substance is selected from the group consisting of alkali metal hydroxides and alkaline earth metal hydroxides, and preferably the basic substance is selected from the group consisting of KOH, NaOH, LiOH, $Ca(OH)_2$, $Mg(OH)_2$, RbOH, $Sr(OH)_2$ and $Ba(OH)_2$, preferably NaOH.

8. The method according to any one of the preceding claims, wherein the aqueous solution comprises at least 50 wt.-% water, preferably at least 70 wt.-% water, more preferably at least 85 wt.-% water, at least 90 wt.-% water or at least 95 wt.-% water.

9. The method according to any one of the preceding claims, wherein the aqueous solution comprises at least 0.3 wt.-% of the basic substance, more preferably at least 0.5 wt.-%, at least 1.0 wt.-%, or at least 1.5 wt.-% of the basic substance, such as 0.5 wt.-% to 10.0 wt.-%, 1.0 wt.-% to 6.0 wt.-%, or 1.5 w.-% to 4.0 wt.-%.

10. The method according to any one of the preceding claims, wherein the method further comprises monitoring the pH level of the aqueous phase obtained from phase separation.

11. The method according to any one of the preceding claims, wherein the liquefied waste plastics (LWP) feedstock has a 5% boiling point of 25°C or more, preferably 30°C or more, or 35°C or more, such as in the range of from 25°C to 120°C, in the range of from 25°C to 100°C, in the range of 30°C to 90°C, or in the range of from 35°C to 80°C.

12. The method according to any one of the preceding claims, wherein the liquefied waste plastics (LWP) feedstock has a 95% boiling point of 700°C or less, preferably 650°C or less, 600°C or less, or 550°C or less, such as in the range of from 180°C to 700°C, 250°C to 700°C, 300°C to 650°C, 350°C to 600°C, 380°C to 500°C, or 400°C to 500°C.

13. The method according to any one of the preceding claims, wherein the LWP feedstock has a density, as measured at 15°C in the range of from 0.780 to 0.950 kg/l, such as in the range of from 0.780 to 0.900 kg/l, or in the range of from 0.780 to 0.850 kg/l.

14. The method according to any one of the preceding claims, wherein mixing ratio, water-oil-ratio, between the aqueous solution and the LWP feedstock in the heat treatment step is in the range of from 0.1 to 1.4 by weight, preferably in the range of 0.2 to 1.0, such as 0.2 to 0.7.