Claims

1. A flash separator comprising

   a. an inlet located at the upper part of the flash separator for feeding a reaction solution into the flash separator,

   b. optionally the inlet is circumvented with an outlet pipe,

   c. a first outlet within the lower part of the flash separator, and

   d. a second outlet within the upper part of the flash separator,

   wherein the inlet has a generally cylindrical wall characterised in that the generally cylindrical wall is perforated with multiple holes having the size of from 15 µm to 1500 µm.

2. A process for separating hydrocarbons from a reaction solution comprising a polymer and said hydrocarbons, comprising the steps of: passing the reaction solution into the flash separator according to claim 1 thereby producing a stream of droplets falling downwards within the flash separator; withdrawing a first solution stream comprising the majority of the polymer through the first outlet; and withdrawing a second solution stream comprising mainly hydrocarbons through the second outlet thereby establishing an upwards moving gas stream within the flash separator.

3. The process according to claim 2 wherein the size of the droplets is sufficiently large so that the droplets are not entrained by the upwards moving gas stream.

4. The process according to claim 2 or claim 3 wherein the pressure within the flash separator is from 1 to 500 bar.

5. The process according to any one of claims 2 to 4 wherein the temperature within the flash separator is from 100 to 400°C.

6. The process according to any one of claims 2 to 5 comprising the step of heating the reaction solution before passing it to the flash separator.

7. The process according to any one of claims 2 to 6 comprising the step of reducing the pressure of the reaction solution before passing it to the flash separator.

8. The process according to any one of claims 2 to 7 wherein the polymer is an olefin copolymer.

9. The process according to claim 8 wherein the olefin copolymer comprises from 10 to 35 wt% of the reaction solution.

10. The process according to claim 9 wherein an amount of comonomer in the reaction solution is at least 1 wt%.

11. The process according to any one of claims 8 to 10 wherein the olefin copolymer is a low density polyethylene.

12. The process according to claim 11 wherein the reaction solution comprises ethylene and at least one polar comonomer.

13. The process according to claim 12 wherein the polar comonomer is selected from the group consisting of alkyl-acrylates, of vinyl acetates, vinyl silanes, and mixtures thereof.

14. The process according to any one of claims 8 to 10 wherein the olefin copolymer is produced in a solution process.

15. The process according to claim 14 wherein the reaction solution comprises an alpha-olefin.