

Claims

1. A separating device for separating volatile compounds from a polymer reaction mixture comprising
 - 5 – a gravimetric separator, having a gravimetric vessel (1), an inlet (2) for feeding the polymer reaction mixture (9), a first outlet (3) located in the lower part of the gravimetric vessel (1) for withdrawing a first polymer-rich stream (10), and a second outlet (4) located in the upper part of the gravimetric vessel (1) for withdrawing a first polymer-lean stream (11); and
 - 10 – a flash separator having a flash vessel (5), a first inlet (6) for feeding a second polymer-lean stream (12) split from the first polymer-lean stream (11), a first outlet (7) located at the lower part of the flash vessel (5) for withdrawing a liquid stream (14), and a second outlet (8) located at the upper part of the flash vessel (5) for
 - 15 withdrawing a gaseous stream (13),wherein the second outlet (4) of the separator vessel (1) is fluidly connected to the first inlet (6) of the flash vessel (5).
2. The separating device according to claim 1, wherein the flash vessel (5) further comprises a second inlet (18) for feeding a second polymer-rich stream (19) split from the first polymer-rich stream (10), wherein the
- 20 first outlet (3) of the separator vessel (1) is fluidly connected with the second inlet (18) of the flash vessel (5).
3. The separating device according to claim 2, wherein the second inlet (18) for feeding a second polymer-rich stream (19) is located between
- 25 the liquid level (27) and the first inlet (6) of the flash vessel (5), wherein the liquid level (27) is the boundary between a gaseous phase and a liquid phase in the flash vessel (5).
4. The separating device according to any of the preceding claims, wherein a second heater (23) and a second pressure control valve (24)
- 30 are located upstream to the first inlet (6) of the flash vessel (5) and downstream of the second outlet (4) of the gravimetric vessel (1).
5. A process for separating volatile compounds from a reaction mixture (9) comprising a polymer and said volatile compounds, comprising the steps of:

- passing the reaction mixture (9) through the inlet (2) into the gravimetric vessel (1) of the gravimetric separator of a separating device according to any of claims 1 to 4,
 - 5 – withdrawing a first polymer-rich stream (10) comprising mainly polymer through the first outlet (3) of the gravimetric vessel (1),
 - withdrawing a first polymer-lean stream (11) comprising mainly volatile compounds through the second outlet (4) of the gravimetric vessel (1),
 - 10 – passing at least a part of the polymer-lean stream (11) as a second polymer-lean stream (12) through the first inlet (6) into the flash vessel (5) of the flash separator of the separating device according to any of claims 1 to 4,
 - withdrawing a liquid stream (14) through the first outlet (7) of the flash vessel (5), and
 - 15 – withdrawing a gaseous stream (13) through the second outlet (8) of the flash vessel (5).
6. The process according to claim 5, wherein the flash separator is a flash separator according to claims 2 to 4 comprising a second inlet (18), wherein the first outlet (3) of the gravimetric vessel (1) is fluidly connected to the second inlet (18) of the flash vessel (5), further comprising the step of
- 20 – passing at least a part of the first polymer-rich stream (10) as the second polymer-rich stream (19) through the second inlet (18) into the flash vessel (5).
- 25 7. The process according to claim 6, wherein the second polymer-rich stream (19) is fed via the second inlet (18) between a liquid level (27) present in the flash vessel (5) and the first inlet (6) of the flash vessel (5), wherein the liquid level (27) is the boundary between a gaseous phase and a liquid phase present in the flash vessel (5).
- 30 8. The process according to any of claims 6 or 7, wherein the third polymer-lean stream (16) and the gaseous stream (13) are combined to form a volatile compounds stream (17).
- 35 9. The process according to any of claims 7 or 8, wherein the third polymer-rich stream (15) and the liquid stream (14) are combined to form the polymer stream (20).

10. The process according to any of claims 5 to 9, wherein the second polymer-lean stream (12) is heated by a second heater (23) to the temperature as provided in the flash vessel (5).
- 5 11. The process according to any one of claims 5 to 10 comprising the step of reducing the pressure of the second polymer-lean stream (12) before introduction into the flash separator.
12. The process according to anyone of claims 5 to 11 wherein the pressure within the flash separator is from 0 to 500 barg.
- 10 13. The process according to any one of claims 5 to 12 wherein the temperature within the flash separator is from 100 to 400 °C.
14. The process according to anyone of claims 5 to 13 wherein the pressure within the gravimetric separator is from 0 to 500 barg.
- 15 15. The process according to any one of claims 5 to 14 wherein the temperature within the gravimetric separator is from 100 to 400 °C.