CLAIMS

1. A process for starting a gas-phase olefin polymerization reaction for producing a particulate polyolefin by polymerizing one or more olefins in a multizone circulating reactor thereby forming a first polyolefin,

wherein the multizone circulating reactor comprises

- a vertical first reactor zone and
- a vertical second reactor zone, which is equipped with a throttling valve at the bottom, a line for discharging polymer, and, in the upper part, means which allow measuring the level of a settled bed of polyolefin particles into the second reactor zone, and
- the upper region of the first reactor zone is connected with the upper region of the second reactor zone by a first connecting part and
- the lower region of the second reactor zone is connected with the lower region of the first reactor zone by a second connecting part; and

wherein the multizone circulating reactor further comprises

- a gas recycle line, which is equipped with a compressor and a heat exchanger for removing the heat of polymerization and which connects the top of the first reactor zone, the top of the second reactor zone or the first connecting part with at least
- a riser gas introduction point for feeding a riser gas at the bottom of the first reactor zone,
- a dosing gas introduction point for feeding a dosing gas into the second reactor zone above the throttling valve; and
- optionally a transport gas introduction point for feeding a transport gas to the second connecting part at the end of the connecting part, which is connected with the lower region of the second reactor zone,

comprising the steps of

a) providing an multizone circulating reactor being filled with a reactor gas at a pressure from 0.1 to 20 MPa and a temperature from 20 to 200°C and containing no polyolefin particles,

b) conveying the reactor gas from the top of the first reactor zone, the top of the second reactor zone or the first connecting part through the gas recycle line to the riser gas introduction point, to the dosing gas introduction point and optionally to the transport gas introduction point;

c) feeding a particulate material comprising a polymerization catalyst or comprising a polymerization catalyst and a second polyolefin into the multizone circulating reactor;

d) controlling the gas flow in the second reactor zone by adjusting the opening of the throttling valve and the flow rates of the gas fed to the riser gas introduction point, to the dosing gas introduction point, and optionally to the transport gas introduction point so that the upwards gas velocity in the bottom part of the second reaction zone is lower than the terminal free-fall velocity of the particulate material fed into the multizone circulating reactor;

e) optionally feeding one or more olefins to the multizone circulating reactor and reacting the one or more olefins in the presence of the polymerization catalyst to the first polyolefin;

f) feeding, with a closed polymer discharged line, one or more olefins or a particulate material comprising a polymerization catalyst and a second polyolefin or one or more olefins and a particulate material comprising a polymerization catalyst and a second polyolefin into the multizone circulating reactor until the weight of the particulate polyolefin in the second reactor zone is higher than the drag force of the upward moving gas and a settled bed of polyolefin particles forms;

g) thereafter, controlling the circulation rate of the polymer particles within the multizone circulating reactor by adjusting the opening of the throttling valve and adjusting the flow rate of the dosing gas, optionally discharging polyolefin and controlling the feeding rates of the one or more olefins and the particulate material comprising a polymerization catalyst and a second polyolefin into the multizone circulating reactor and the rate for the optional discharge of the produced polyolefin in a way that the combined amounts of introduced second polyolefin and olefin(s) are higher than the amount of discharged polyolefin until the level of the settled bed of polyolefin particles reaches the upper part of the second reactor zone;

h) thereafter, controlling the circulation rate of the polymer particles within the multizone circulating reactor by adjusting the opening of the throttling valve and adjusting the flow rate of the dosing gas, discharging polyolefin and controlling the feeding rates of the one or more olefins and the particulate material comprising a polymerization catalyst and a second polyolefin into the multizone circulating reactor and the discharge rate of the produced polyolefin in a way that the combined amounts of introduced second polyolefin and olefin(s) are balanced with the amount of discharged polyolefin.

2. The process of claim 1, wherein the first reactor zone is a riser, in which growing polymer particles flow upwards under fast fluidization or transport conditions.

3. The process of claim 2, wherein in step d) the upwards gas velocity in the first reactor zone is higher than the terminal free-fall velocity of the particulate material fed into the multizone circulating reactor.

4. The process of claim 1, wherein the first reactor zone is a reactor zone, in which the polymerization occurs in a fluidized bed of growing polymer particles.

5. The process of any of claims 1 to 4, wherein in step f), a liquid hydrocarbon which vaporizes under the conditions within the second reactor zone is fed into the second reactor zone.

6. The process of any of claims 1 to 5, wherein the particulate material comprising the polymerization catalyst or comprising the polymerization catalyst and the second polyolefin is fed into the lower part of the first reactor zone or into the second connecting part.

7. The process of any of claims 1 to 6, wherein the throttling valve is a butterfly valve.

8. The process of any of claims 1 to 7, wherein the reactor gas comprises one or more alkanes having from 1 to 10 carbon atoms and the amount of alkanes having from 1 to 10 carbon atoms in the reactor gas is from 30 to 99 vol.%.

9. The process of any of claims 1 to 8, wherein the particulate material is a pre-polymerized polymerization catalyst.

10. The process of any of claims 1 to 9, wherein the multizone circulating reactor is part of a reactor cascade.

11. The process of claim 10, wherein the particulate material comprising the polymerization catalyst is a second polyolefin produced in a polymerization reactor arranged upstream of the multizone circulating reactor.

12. The process of claim 11, wherein the polymerization reactor arranged upstream of the multizone circulating reactor is a fluidized bed reactor.

13. The process of any of claims 1 to 12, wherein the polyolefin is an ethylene polymer prepared by homopolymerizing ethylene or copolymerizing ethylene with one or more comonomers.

14. The process of any of claims 1 to 12, wherein the polyolefin is a propylene polymer prepared by homopolymerizing propylene or copolymerizing propylene with one or more comonomers.

15. A process for producing a polyolefin by polymerizing one or more olefins in a multizone circulating reactor, wherein the polymerization reaction has been started by any of the processes of claims 1 to 14.