PROCESS FOR PRODUCING POLYOLEFINS

Field of the Invention

The present invention is directed to a process of producing olefin polymers in the presence of an olefin polymerisation catalyst. More specifically, the present invention is directed to a process of polymerising at least one olefin in gas phase in at least two polymerisation stages.

Description of Related Art

WO-A-2004/039847 discloses a process where ethylene was polymerised in a loop reactor followed by the polymerisation in a gas phase reactor. The polymer slurry was directed from the loop reactor into a high pressure flash and from the flash into a gas exchange zone to eliminate the carry-over of the reaction gas from the loop reactor into the gas phase reactor.

WO-A-00/42077 discloses a process where ethylene was polymerised in a loop reactor followed by the polymerisation in a gas phase reactor. The polymer slurry was directed into a liquid-filled column to eliminate the carry-over of the reactants from the loop reactor into the gas phase reactor.

Summary ~~of the Invention~~

The aim of the disclosure ~~invention~~ is to provide which is capable of producing multimodal olefin polymers. Thus, the process of the disclosure ~~invention~~ is capable of producing polymer compositions comprising at least two components having widely differing molecular weights and/or contents of comonomer. Further, the present disclosure ~~invention~~ provides a simple and economical process for transferring the polymer from one polymerisation reactor into another. Especially the present disclosure ~~invention~~ provides a significantly lower investment cost and operating cost than prior art processes.

In one aspect, there is provided a process of producing a polymer of at least one olefin in two consecutive reactors in gas phase in the presence of an olefin polymerisation catalyst comprising the steps of:

- polymerising an olefin in a first polymerization reactor in the presence of an olefin polymerisation catalyst and a first reaction gas mixture to form a fluidized bed comprising an olefin polymer and said first reaction gas mixture;
- continuously or intermittently withdrawing said first reaction gas mixture together with said olefin polymer comprising said olefin polymerisation catalyst dispersed therein from the first polymerisation reactor to form a first product stream;
- directing said first product stream into a separation vessel to form a bed of olefin polymer in said separation vessel;
- withdrawing a stream of said first reaction gas mixture from said separation vessel and returning it into said first polymerization reactor;
- continuously or intermittently withdrawing said olefin polymer from said separation vessel to form a second product stream; and
- directing said second product stream into a second polymerization reactor,

characterised in that the pressure in said separation vessel is within 10 % of the pressure in said first reaction stage at the point from where said first product stream is withdrawn and that said stream of the first reaction gas mixture is returned into said first polymerization stage to a point where the pressure is lower than in said separation vessel.

The present disclosure ~~invention~~ provides a process of producing a polymer of at least one olefin in two consecutive reactors in gas phase in the presence of an olefin polymerisation catalyst comprising the steps of: