CLAIMS:

1. A method for decreasing triboelectric charging of, and/or reactor fouling by, polyolefin particles in a fluidized bed-type gas phase polymerization reactor (FBT-GPP reactor) comprising a distributor plate and a wall defining a reaction zone, wherein the polyolefin particles are located in the reaction zone and the reaction zone is located above and in fluid communication with the distributor plate, the method comprising:

feeding an argon gas/nitrogen gas mixture upward through the distributor plate into the reaction zone to fluidize the polyolefin particles in the reaction zone, wherein the argon gas/nitrogen gas mixture consists of from 5 volume percent (vol%) to no more than 65 vol% argon gas, from 95 vol% to no less than 10 vol% nitrogen gas, and from 0 vol% to no more than 5 vol% helium gas, wherein the sum of all these vol% equals 100 vol% of the argon gas/nitrogen gas mixture.

2. The method of claim 1:

wherein decreasing triboelectric charging means that the electrostatic charge of the polyolefin particles is lower than the electrostatic charge of polyolefin particles in a comparative method using an inert gas that is 100 vol% nitrogen gas in place of the argon gas/nitrogen gas mixture; and

wherein the triboelectric charge of the polyolefin particles is measured on a sample of the polyolefin particles that have been removed from the FBT-GPP reactor wherein the measurement is done according to Charge Measurement Test Method described herein; or wherein the FBT-GPP reactor comprises a static probe and the triboelectric charge of the polyolefin particles is measured by the static probe; and/or

wherein decreasing reactor fouling means that an amount of adhered polyolefin material, if any, in the FBT-GPP reactor is lower relative to an amount of adhered polyolefin material in the FBT-GPP reactor of a comparative method using an inert gas that is 100 vol% nitrogen gas in place of the argon gas/nitrogen gas mixture.

3. The method of claim 1 or claim 2 wherein the argon gas/nitrogen gas mixture has any one of limitations (i) to (v):

(i) the amount of argon gas is: (a) from 9 vol% to no more than 65 vol% argon gas, (b) from 10 vol% to no more than 60 vol% argon gas, (c) from 10 vol% to no more than 55 vol% argon gas, (d) from 10 vol% to no more than 50 vol% argon gas, (e) from 10 vol% to no more than 45 vol% argon gas, or (f) from 10 vol% to no more than 35 vol% argon gas;

(ii) the amount of nitrogen gas is: (a) from 90 vol% to no less than 35 vol% nitrogen gas, (b) from 90 vol% to no less than 40 vol% nitrogen gas, (c) from 90 vol% to no less than 45 vol%

nitrogen gas, (d) from 90 vol% to no less than 50 vol% nitrogen gas, (e) from 90 vol% to no less than 55 vol% nitrogen gas, or (f) from 90 vol% to no less than 65 vol% nitrogen gas;

(iii) the amounts of argon gas and nitrogen gas are selected from the group consisting of: limitations (i)(a) and (ii)(a), limitations (i)(b) and (ii)(b), limitations (i)(c) and (ii)(c), limitations (i)(d) and (ii)(d), limitations (i)(e) and (ii)(e), or limitations (i)(f) and (ii)(f);

(iv) the argon gas/nitrogen gas mixture lacks helium (i.e., 0 vol% helium); or

(v) limitation (iv) and any one of limitations (i) to (iii).

4. The method of any one of claims 1-3 having any one of limitations (i) to (iii):

(i) wherein the decreasing triboelectric charging means that the triboelectric charge of the polyolefin particles after 10 hours of fluidization by the argon gas/nitrogen gas mixture is lower by at least 10%, alternatively by at least 20%, alternatively at least 30%, relative to triboelectric charge of a comparative polyolefin particles that have been fluidized for 10 hours in a comparative method by using an inert gas that is 100 vol% nitrogen gas in place of the argon gas/nitrogen gas mixture;

(ii) wherein the decreasing reactor fouling means that an amount of adhered polyolefin material, if any, in the FBT-GPP reactor after 10 hours is lower by at least 10%, alternatively by at least 20%, alternatively at least 30%, relative to an amount of adhered polyolefin material in the FBT-GPP reactor after 10 hours of a comparative method using an inert gas that is 100 vol% nitrogen gas in place of the argon gas/nitrogen gas mixture and wherein the amount of adhered polyolefin material equals any one of amounts (a) to (d): (a) the weight of polyolefin particles adhered to the distributor plate, (b) the weight of polyolefin particles adhered to the reactor wall, or (c) the total of the weights (a) to (b); or

(iii) both limitations (i) and (ii).

5. The method of any one of claims 1-4, wherein the FBT-GPP reactor comprises, in sequential fluid communication, a bottom zone, the distributor plate, the wall defining the reaction zone, a wall defining a velocity reduction zone, a recycle line, and a compressor, lines for inletting feeds, and an outlet for removing polyolefin particles, and optionally a static probe; wherein the recycle line fluidly connects the velocity reduction zone to the compressor and the compressor to the bottom zone.

6. The method of claim 5, comprising contacting in the reaction zone a feed of an olefin polymerization catalyst and a feed of one or more olefin monomers to polymerize the one or more olefin monomers and make the polyolefin particles, wherein the feeding of the argon gas/nitrogen gas mixture and the contacting steps are performed at the same time; wherein the feeding or feedings of the one or more olefin monomers comprises injecting the one or more

olefin monomers into the bottom zone, the reaction zone, the recycle line, or a combination of any two or more thereof; wherein the feeding of the polymerization catalyst comprises injecting the olefin polymerization catalyst into the reaction zone, the velocity reduction zone, or both; and wherein the feeding of the argon gas/nitrogen gas mixture comprises injecting the argon gas/nitrogen gas mixture into the bottom zone, the recycle line, or both; wherein a recycle gas mixture comprising one or more process gases, has been removed from the velocity reduction zone, compressed by the compressor, and fed into the bottom zone, all via the recycle line.

7. The method of claim 6, wherein the olefin polymerization catalyst is fed as a dry solid or a slurry, the slurry comprising solid olefin polymerization catalyst dispersed in a saturated hydrocarbon (e.g., mineral oil or isopentane).

8. The method of claim 6 or claim 7, wherein the one or more olefin monomers comprises ethylene, propylene, a (C4−C12)α-olefin, or a combination of any two or more thereof; wherein the olefin polymerization catalyst comprises a metallocene catalyst, a post-metallocene catalyst, a combination of first a post-metallocene catalyst and a second post-metallocene catalyst, a Ziegler-Natta catalyst, a combination of a post-metallocene catalyst and a Ziegler-Natta catalyst, a chrome-based catalyst, a combination of two different metallocene catalysts, or a combination of a metallocene catalyst and a post-metallocene catalyst; and wherein the polyolefin particles comprise polyethylene particles (e.g., a polyethylene homopolymer), polypropylene particles, or ethylene/(C4−C12)α-olefin copolymer particles (e.g., an ethylene/1-butene copolymer, an ethylene/1-hexene copolymer, or an ethylene/1-octene copolymer).

9. The method of any one of claims 1-8, wherein the polyolefin particles comprise a low-density polyethylene; or wherein the polyolefin particles comprise a linear low density polyethylene or a high-density polyethylene; or wherein the polyolefin particles comprise a very low linear density polyethylene.

10. The method of any one of claims 1-9, wherein the method comprises operating an olefin polymerization process in the FBT-GPP reactor at an operating temperature from 70 °C to 120 °C and an operating total pressure of 1,500 kilopascals (kPa) to 3,000 kPa.