RATING POLYMERIZATION PROCESSES

Field of Disclosure

[0001] Embodiments of the present disclosure are directed methods for rating a polymerization process, more specifically, embodiments are directed towards methods for rating polymerization processes based upon a first cracking index value and a second cracking index value.

Background

[0002] Polymers may be utilized for a number of products including films and pipes, among others. Polymers can be formed by reacting one or more types of monomer in a polymerization reaction. There is continued focus in the industry on developing new and improved materials and/or methods that may be utilized to form polymers having one or more desirable properties.

Summary

[0003] The present disclosure provides methods for rating a polymerization processes including: determining a first cracking index value for a first polymerization process; changing a parameter of the first polymerization process to provide a second polymerization process; determining a second cracking index value for the second polymerization process; and rating the first polymerization process and the second polymerization process based upon the first cracking index value and the second cracking index value.

[0003a] In one aspect, the present disclosure refers to a method for rating a polymerization process, comprising: determining a first cracking index value for a first polymerization process; changing one or more parameters of the first polymerization process to provide a second polymerization process; determining a second cracking index value for the second polymerization process; and rating the first polymerization process and the second polymerization process based upon the first cracking index value and the second cracking index value, wherein a greater relative cracking index value corresponds

to a higher relative rating, and wherein the cracking index values for the polymerization processes are respectively expressed as

$$I_{pc} = \frac{\frac{weight\ of\ polymer\ produced}{weight\ of\ catalyst\ utilized} - \frac{D_{vr}^3\rho_r - D_{vc}^3\rho_c}{D_{vc}^3\rho_c}}{\frac{weight\ of\ polymer\ produced}{weight\ of\ catalyst\ utilized}}$$

where I_{pc} is the cracking index value, D_{vc} is a catalyst volume-averaged particle size, ρ_c is a catalyst granular particle density, D_{vr} is a volume-averaged particle size of polymer produced, and ρ_r is a granular particle density of polymer produced.

[0004] The above summary of the present disclosure is not intended to describe each disclosed example or every implementation of the present disclosure. The description that follows more particularly exemplifies illustrative examples. In several places throughout the application, guidance is provided through lists of examples, which examples can be used in various combinations. In each instance, the recited list serves only as a representative group and should not be interpreted as an exclusive list.

Claims

What is claimed:

1. A method for rating a polymerization process, comprising:

determining a first cracking index value for a first polymerization process;

changing one or more parameters of the first polymerization process to provide a second polymerization process;

determining a second cracking index value for the second polymerization process; and

rating the first polymerization process and the second polymerization process based upon the first cracking index value and the second cracking index value, wherein a greater relative cracking index value corresponds to a higher relative rating, and wherein the cracking index values for the polymerization processes are respectively expressed as

$$I_{pc} = \frac{\frac{weight\ of\ polymer\ produced}{weight\ of\ catalyst\ utilized} - \frac{D_{vr}^3\rho_r - D_{vc}^3\rho_c}{D_{vc}^3\rho_c}}{\frac{weight\ of\ polymer\ produced}{weight\ of\ catalyst\ utilized}}$$

where I_{pc} is the cracking index value, D_{vc} is a catalyst volume-averaged particle size, ρ_c is a catalyst granular particle density, D_{vr} is a volume-averaged particle size of polymer produced, and ρ_r is a granular particle density of polymer produced.

2. The method of claim 1, wherein the first cracking index value is greater than the second cracking index value.

3. The method of claim 2, wherein the first polymerization process is rated higher than the second polymerization process.

4. The method of claim 2, wherein the second polymerization process is rated higher than the first polymerization process.

5. The method of claim 1, wherein the changed parameter of the first polymerization process is a catalyst.

6. The method of claim 1, wherein the changed parameter of the first polymerization process is a residence time.

7. The method of claim 6, wherein the residence time is increased from the first polymerization process to the second polymerization process.

8. The method of claim 6, wherein the residence time is decreased from the first polymerization process to the second polymerization process.