Claims

1. A method for modifying the rheology of a polymer, comprising:

extruding a molten polymer and a composition consisting essentially of at least one organic peroxide, at least one emulsifier, and water in emulsion form; and

removing volatile compounds from the molten polymer under extrusion conditions and under a predetermined vacuum,

wherein the polymer comprises a polyolefin,

wherein the volatile compounds comprise water and volatile organic compounds resulting fro the degradation of at least one of the organic peroxide or the polymer,

wherein removing volatile compounds is performed by establishing the predetermined vacuum in at least one extruder venting zone.

2. The method of claim 1, wherein the predetermined vacuum is set to from 0 mbar to 800 mbar.
3. The method of claim 1, wherein the at least one extruder venting zone is provided in at least one extruder decompression zone.
4. The method of claim 1, the method further comprising feeding the polymer and the composition so that the amount of the at least one peroxide feed ranges from 100 ppm to 6000 ppm with respect to the amount of the polymer feed.
5. The method of claim 1, wherein the at least one organic peroxide contains less than 10% by weight of active oxygen with respect to the total weight of organic peroxide(s).
6. The method of claim 1, wherein the at least one organic peroxide is selected from the group comprising dialkyl peroxides.
7. The method of claim 6, wherein at least one organic peroxide is selected from the group comprising 2,5-dimethyl-2,5-di(tert-butylperoxy)hexane-3, ditert-butyl peroxide, ditert-amyl peroxide, tert-butyl cumyl peroxide, di(tert-butylperoxy-isopropyl)-benzene, dicumyl peroxide, 3,6,9-triethyl-3,6,9-trimethyl-1,4,7-triperoxonane, 3,3,5,7,7-pentamethyl-1,2,4trioxepane and combinations thereof.

8. The method of claim 1, wherein the polyolefin is selected from the group comprising polypropylene homopolymers, polyethylene homopolymers, copolymers comprising propylene, copolymers comprising ethylene and combinations thereof.
9. The method of claim 1, wherein the at least one emulsifier is selected from the group comprising polyethoxy phenols, alkylene oxide block copolymers, ethoxylated fatty

alcohols, ethoxylated fatty acids, sorbitan fatty acid esters, sorbitol esters, and combinations thereof.

10. The method of claim 1, further comprising adding water to the molten polymer and emulsion mixture in the extruder, beyond the water contained in the emulsion, to further deactivate catalyst sites.

11. The method of claim 1, wherein the composition consists essentially of 20% to 80% by weight of the at least one organic peroxide, up to 15% by weight of the at least one emulsifier, and water in quantity enough to complete the 100% of the composition total weight.

12. A method for modifying the rheology of a polymer, comprising:

extruding a molten polymer and a composition comprising at least one organic peroxide and water in emulsion form, wherein the composition does not include mineral oil; and

removing volatile compounds from the molten polymer under extrusion conditions and under a predetermined vacuum,

wherein the polymer comprises a polyolefin,

wherein the volatile compounds comprise water and volatile organic compounds resulting fro the degradation of at least one of the organic peroxide or the polymer,

wherein removing volatile compounds is performed by establishing the predetermined vacuum in at least one extruder venting zone.

13. The method of claim 12, wherein the predetermined vacuum is set to from 0 mbar to 800 mbar.

14. The method of claim 12, wherein the at least one extruder venting zone is provided in at least one extruder decompression zone.

15. The method of claim 12, the method further comprising feeding the polymer and the composition so that the amount of the at least one peroxide feed ranges from 100 ppm to 6000 ppm with respect to the amount of the polymer feed.

16. The method of claim 12, wherein the at least one organic peroxide contains less than 10% by weight of active oxygen with respect to the total weight of organic peroxide(s).

17. The method of claim 12, wherein the at least one organic peroxide is selected from the group comprising dialkyl peroxides.

18. The method of claim 17, wherein at least one organic peroxide is selected from the group comprising 2,5-dimethyl-2,5-di(tert-butylperoxy)hexane-3, ditert-butyl peroxide, ditert-amyl peroxide, tert-butyl cumyl peroxide, di(tert-butylperoxy-isopropyl)-benzene, dicumyl peroxide, 3,6,9-triethyl-3,6,9-trimethyl-1,4,7-triperoxonane, 3,3,5,7,7-pentamethyl-1,2,4trioxepane and combinations thereof.

19. The method of claim 1, wherein the polyolefin is selected from the group comprising polypropylene homopolymers, polyethylene homopolymers, copolymers comprising propylene, copolymers comprising ethylene and combinations thereof.

20. The method of claim 12, wherein the composition consists essentially of 20% to 80% by weight of the at least one organic peroxide, up to 15% by weight of the at least one emulsifier, and water in quantity enough to complete the 100% of the composition total weight.