CLAIMS

What is claimed is:

1. A process for emulsion polymerization comprising:

introducing into an emulsion polymerization mixture a chain transfer agent composition comprising at least one branched C_{10} mercaptan,

wherein the at least one branched C_{10} mercaptan is selected from 5-methyl-1-mercapto-nonane, 3-propyl-1-mercapto-heptane, 4-ethyl-1-mercapto-octane, 2-butyl-1-mercapto-hexane, 5-methyl-2-mercapto-nonane, 3-propyl-2-mercapto-heptane, 4-ethyl-2-mercapto-octane, 5-methyl-5-mercapto-nonane, or combinations thereof.

2. The process of claim 1, wherein the chain transfer agent composition is present in an amount of 0.01 wt.% to 5 wt.%. % based on a total weight of the emulsion polymerization mixture.

3. The process of claim 1, wherein the at least one branched C_{10} mercaptan is present in an amount of at least 30 wt.% based on a total weight of the chain transfer agent composition.

4. The process of claim 1, wherein the chain transfer agent composition further comprises one or more of a C_{12} mercaptan, a C_{14} mercaptan, a C_{16} mercaptan, a C_{18} mercaptan, or combinations thereof.

5. The process of claim 4, wherein the chain transfer agent composition includes less than 10 wt.% C_{16-36} sulfides based on a total weight of the chain transfer agent composition.

6. The process of claim 4, wherein the at least one branched C_{10} mercaptan, the C_{12} mercaptan, the C_{14} mercaptan, the C_{16} mercaptan, and the C_{18} mercaptan are present in an amount of at least 85 wt.% based on a total weight of the chain transfer agent composition.

7. The process of claim 1, wherein the chain transfer agent composition includes less than 10 wt.% C_{16-36} sulfides based on a total weight of the chain transfer agent composition.

8. The process of claim 1, wherein the emulsion polymerization mixture comprises one or more monomer, on or more surfactant, one or more polymerization initiator, and water.

9. The process of claim 1, further comprising:

forming the emulsion polymerization mixture comprising one or more monomer, one or more surfactant, optionally one or more polymerization initiator, water, or combinations thereof; and

after the step of introducing, recovering a polymer form the emulsion polymerization mixture.

10. The process of claim 1, wherein the emulsion polymerization mixture comprises at least one component capable of free radical polymerization.

11. An emulsion polymerization reaction mixture comprising:

a chain transfer agent composition, wherein the chain transfer agent composition comprises at least one branched C_{10} mercaptan,

wherein the C_{10} mercaptan is selected from 5-methyl-1-mercapto-nonane, 3-propyl-1-mercapto-heptane, 4-ethyl-1-mercapto-octane, 2-butyl-1-mercapto-hexane, 5-methyl-2-mercapto-nonane, 3-propyl-2-mercapto-heptane, 4-ethyl-2-mercapto-octane, 5-methyl-5-mercapto-nonane, or combinations thereof;

one or more monomer;

one or more surfactant;

one or more polymerization initiator; and

water.

12. The mixture of claim 11, wherein the chain transfer agent composition is present in an amount of 0.01 wt.% to 5 wt.%. % based on a total weight of the emulsion polymerization mixture.

13. The mixture of claim 11, wherein the at least one branched C_{10} mercaptan is present in an amount of at least 30 wt.% based on a total weight of the chain transfer agent composition.

14. The mixture of claim 11, wherein the chain transfer agent composition further comprises one or more of a C_{12} mercaptan, a C_{14} mercaptan, a C_{16} mercaptan, a C_{18} mercaptan, or combinations thereof.

15. The mixture of claim 12, wherein the chain transfer agent composition includes less than 10 wt.% C_{16-36} sulfides based on a total weight of the chain transfer agent composition.

16. The mixture of claim 12, wherein the at least one branched C_{10} mercaptan, the C_{12} mercaptan, the C_{14} mercaptan, the C_{16} mercaptan, and the C_{18} mercaptan are present in an amount of at least 85 wt.% based on a total weight of the chain transfer agent composition.

17. The mixture of claim 11, wherein the chain transfer agent composition includes less than 10 wt.% C_{16-36} sulfides based on a total weight of the chain transfer agent composition.

18. The mixture of claim 11, being capable of free radical polymerization.

19. A chain transfer agent composition comprising:

at least one branched C_{10} mercaptan selected from 5-methyl-1-mercapto-nonane, 3-propyl-1-mercapto-heptane, 4-ethyl-1-mercapto-octane, 2-butyl-1-mercapto-hexane, 5-methyl-2-mercapto-nonane, 3-propyl-2-mercapto-heptane, 4-ethyl-2-mercapto-octane, 5-methyl-5-mercapto-nonane, or combinations thereof.

20. The composition of claim 19, wherein the at least one branched C_{10} mercaptan is present in an amount of at least 30 wt.% based on a total weight of the chain transfer agent composition.

21. The composition of claim 20, further comprising one or more of a C_{12} mercaptan, a C_{14} mercaptan, a C_{16} mercaptan, a C_{18} mercaptan, or combinations thereof.

22. The comp of claim 21, wherein the chain transfer agent composition includes less than 10 wt.% C_{16-36} sulfides based on a total weight of the chain transfer agent composition.

23. The composition of claim 21, wherein the at least one branched C_{10} mercaptan, the C_{12} mercaptan, the C_{14} mercaptan, the C_{16} mercaptan, and the C_{18} mercaptan are present in an amount of at least 85 wt.% based on a total weight of the chain transfer agent composition.

24. The composition of claim 19, comprising less than 10 wt.% C_{16-36} sulfides based on a total weight of the chain transfer agent composition.

25. The composition of claim 19, wherein the chain transfer agent composition has an odor which is less unpleasant than an odor of mercaptan compounds which include n-dodecyl mercaptans, tert-dodecyl mercaptans, or combinations thereof present in an amount of equal to or greater than 25 wt.% of the mercaptan compounds in an otherwise similar chain transfer agent composition.