The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An additive composition for control and inhibition of polymerization of aliphatic monomers comprising butadiene, and for control and inhibition of dimerization of aliphatic monomers comprising butadiene, said additive composition comprising:

   A) one or more of a first component comprising

      a) quinone methide (QM),

      b) an ester derivative of quinone methide,

      c) nitroxide compounds, or

      d) a mixture thereof;

   and wherein the composition further comprises:

   B) one or more of a second component selected from amines or polyamines comprising:

      i) oxide treated tertiary amines,

      ii) hydroxyl alkyl tertiary amines,

      iii) polyether amines, or

      iv) a mixture thereof.

2. The additive composition as claimed in claim 1, wherein the oxide treated tertiary amine comprises N,N,N′,N′-Tetrakis (2-hydroxypropyl) ethylene-diamine.

3. The additive composition as claimed in claim 1 or claim 2, wherein the hydroxyl alkyl tertiary amine comprises tris(2-hydroxypropyl)amine (TIPA).

4. The additive composition as claimed in any one of claims 1 to 3, wherein the nitroxide compound comprises 1-oxyl-2,2,6,6-tetramethylpiperidin-4-ol (4HT).

5. The additive composition as claimed in any one of claims 1 to 4, wherein the composition comprises:

   a) about 40 to about 99.75 % by weight of one or more of said first component; and

b) about 0.25 to about 60 % by weight of said second component.

6. A method of using an additive composition for controlling and inhibiting polymerization of aliphatic monomers comprising butadiene, and for controlling and inhibiting dimerization of aliphatic monomers comprising butadiene, wherein the method comprises adding the additive composition to a stream of the aliphatic monomers comprising the butadiene, and wherein the additive composition comprises:

A) one or more of component A comprising:

a) quinone methide (QM),

b) an ester derivative of quinone methide,

c) nitroxide compounds, or

d) a mixture thereof;

and wherein the composition further comprises:

B) one or more of component B selected from amines or polyamines comprising:

i) oxide treated tertiary amines,

ii) hydroxyl alkyl tertiary amines,

iii) polyether amines, or

iv) a mixture thereof.

7. The method as claimed in claim 6, wherein the oxide treated tertiary amine comprises N,N,N′,N′-Tetrakis (2-hydroxypropyl) ethylene-diamine .

8. The method as claimed in claim 6 or claim 7, wherein the hydroxyl alkyl tertiary amine comprises tris(2-hydroxypropyl)amine (TIPA).

9. The method as claimed in any one of claims 6 to 8, wherein the nitroxide compound comprises 1-oxyl-2,2,6,6-tetramethylpiperidin-4-ol (4HT).

10. The method as claimed in any one of claims 6 to 9, wherein the composition comprises:

a) about 40 to about 99.75 % by weight of one or more of said component A; and

b) about 0.25 to about 60 % by weight of said component B.

11. The method as claimed in any one of claims 6 to 10, wherein an amount of the composition added to the stream of the aliphatic monomers comprising the butadiene varies from about 0.01 ppm to about 2000 ppm, or from about 1 ppm to about 2000 ppm by weight of the stream.

12. The method as claimed in any one of claims 6 to 11, wherein the component A and the component B are added to the stream either individually or after mixing.

13. The method as claimed in any one of claims 6 to 12, wherein the stream excludes aromatic monomers.

14. A method for controlling and inhibiting polymerization of aliphatic monomers comprising butadiene, and for controlling and inhibiting dimerization of aliphatic monomers comprising butadiene, wherein said monomers are treated with an additive composition comprising:

A) one or more of component A comprising:

a) quinone methide (QM),

b) an ester derivative of quinone methide,

c) nitroxide compounds, or

d) a mixture thereof;

and wherein the composition further comprises:

B) one or more of component B selected from amines or polyamines, wherein said amine and polyamine comprises:

i) oxide treated tertiary amines,

ii) hydroxyl alkyl tertiary amines,

iii) polyether amines, or

iv) a mixture thereof.

15. The method as claimed in claim 14, wherein the oxide treated tertiary amine comprises N,N,N′,N′-Tetrakis (2-hydroxypropyl) ethylene-diamine .

16. The method as claimed in claim 14 or claim 15, wherein the hydroxyl alkyl tertiary amine comprises tris(2-hydroxypropyl)amine (TIPA).

17. The method as claimed in any one of claims 14 to 16, wherein the nitroxide compound comprises 1-oxyl-2,2,6,6-tetramethylpiperidin-4-ol (4HT).

18. The method as claimed in any one of claims 14 to 17, wherein the composition comprises:

a) about 40 to about 99.75 % by weight of one or more of said component A; and

b) about 0.25 to about 60 % by weight of said component B.

19. The method as claimed in any one of claims 14 to 18, wherein an amount of the composition added to a stream of the aliphatic monomers comprising the butadiene varies from about 0.01 ppm to about 2000 ppm, or from about 1 ppm to about 2000 ppm by weight of the stream.

20. The method as claimed in any one of claims 14 to 19, wherein the component A and the component B are added to the stream individually.

21. The method as claimed in any one of claims 14 to 19, wherein the component A and the component B are added to the stream after mixing.

22. The method as claimed in any one of claims 14 to 21, wherein the stream excludes aromatic monomers.

23. The method as claimed in any one of claims 14 to 22, wherein the temperature of the polymerization varies from about 50 degree C to about 180 degree C, or from about 60 degree C to about 180 degree C.

24. A method for preparing the additive composition as defined in any one of claims 1 to 5 for controlling and inhibiting polymerization of aliphatic monomers comprising butadiene, and for controlling and inhibiting dimerization of aliphatic monomers comprising butadiene, the method comprising:

(A) mixing one or more of said component A comprising:

a) quinone methide (QM),

b) an ester derivative of quinone methide,

c) nitroxide compounds, or

d) a mixture thereof;

and wherein the compounds are further mixed with

B) one or more of said component B selected from amines or polyamines comprising:

i) oxide treated tertiary amines,

ii) hydroxyl alkyl tertiary amines,

iii) polyether amines, or

iv) a mixture thereof.