vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$;

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group;

L^2 is a C_1 to C_{32} hydrocarbylene group; and

A^2 is a hydrocarbyl group comprising a hindered double bond.

[0004a] In one aspect, the present disclosure relates to a curable composition comprising (A) a polyolefin component comprising an unsaturated polyolefin of the formula A^1L^1 that has a viscosity less than 100,000 cP; wherein the viscosity is a Brookfield viscosity (as measured at 177 °C) in accordance with ASTM-D3236 and (B) a curing component comprising a cross-linking agent, wherein:

L^1 is a polyolefin;

A^1 is selected from the group consisting of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylidene group of the formula $CH_2=C(Y^1)–$, a mixture of a vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$; and

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group; and wherein the (A) polyolefin component is present in an amount of from 1 wt% to 25 wt%, based on the total weight of the curable composition.

[0004b] In another aspect, the present disclosure relates to a curable composition comprising (A) a polyolefin component comprising a telechelic polyolefin of the formula $A^1L^1L^2A^2$ that has a viscosity less than 100,000 cP; wherein the viscosity is a Brookfield viscosity (as measured at 177 °C) in accordance with ASTM-D3236 and (B) a curing component comprising a cross-linking agent, wherein:

L^1 is a polyolefin;

A^1 is selected from the group consisting of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylidene group of the formula $CH_2=C(Y^1)–$, a mixture of a vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl

group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$;

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group;

L^2 is a C_1 to C_{32} hydrocarbylene group; and

A^2 is a hydrocarbyl group comprising a hindered double bond; and wherein the (A) polyolefin component is present in an amount of from 1 wt% to 25 wt%, based on the total weight of the curable composition.

[0004c] In another aspect, the present disclosure relates to a curable composition comprising (A) a polyolefin component comprising an unsaturated polyolefin of the formula A^1L^1 that has a viscosity less than 100,000 cP and a telechelic polyolefin of the formula $A^1L^1L^2A^2$ that has a viscosity less than 100,000 cP; wherein the viscosity is a Brookfield viscosity (as measured at 177 °C) in accordance with ASTM-D3236 and (B) a curing component comprising a cross-linking agent, wherein:

L^1 at each occurrence independently is a polyolefin;

A^1 at each occurrence independently is selected from the group consisting of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylidene group of the formula $CH_2=C(Y^1)–$, a mixture of a vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$;

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group;

L^2 is a C_1 to C_{32} hydrocarbylene group; and

A^2 is a hydrocarbyl group comprising a hindered double bond; and wherein the (A) polyolefin component is present in an amount of from 1 wt% to 25 wt%, based on the total weight of the curable composition.

[0005] The curable composition may further comprise (C) an additive component. The (C) additive component may comprise a UV stabilizer. Further, the (C) additive component may comprise a blowing agent. The curable composition may further comprise (D) at least one other polymer.

[0005a] In another aspect, the present disclosure relates to an article made from the curable composition as described herein, wherein the article is a crosslinked foam.

[0005b] In another aspect, the present disclosure relates to an article made from the curable composition as described herein, wherein the article is an encapulant film.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIGS. 1A and 1B provide the 1H NMR and GC/MS spectra for the synthesis of CTA 1, respectively.

[0007] FIG. 2 provides the 1H NMR spectrum for the synthesis of CTA 2.

[0008] FIG. 3 provides the 1H NMR spectrum for the synthesis of a telechelic polyolefin using CTA 7.

[0009] FIG. 4 provides the 1H NMR spectrum for the synthesis of a telechelic polyolefin using CTA 8.

DETAILED DESCRIPTION

Definitions

[0010] All references to the Periodic Table of the Elements herein shall refer to the Periodic Table of the Elements, published and copyrighted by CRC Press, Inc., 2003. Also, any references to a Group or Groups shall be to the Group or Groups reflected in this Periodic Table of the Elements using the IUPAC system for numbering groups. Unless stated to the contrary, implicit from the context, or customary in the art, all parts and percents are based on weight. For purposes of United States patent practice, the contents of any patent, patent application, or publication referenced herein are hereby incorporated by reference in their entirety (or the equivalent US version thereof is so incorporated by reference) especially with respect to the disclosure of synthetic techniques, definitions (to the extent not inconsistent with any definitions provided herein) and general knowledge in the art.

[0011] The numerical ranges disclosed herein include all values from, and including, the lower and upper value. For ranges containing explicit values (e.g., 1, or 2, or 3 to 5, or 6, or 7), any subrange between any two explicit values is included (e.g., 1 to 2; 2 to 6; 5 to 7; 3 to

What is claimed is:

1. A curable composition comprising (A) a polyolefin component comprising an unsaturated polyolefin of the formula A^1L^1 that has a viscosity less than 100,000 cP; wherein the viscosity is a Brookfield viscosity (as measured at 177 °C) in accordance with ASTM-D3236 and (B) a curing component comprising a cross-linking agent, wherein:

L^1 is a polyolefin;

A^1 is selected from the group consisting of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylidene group of the formula $CH_2=C(Y^1)–$, a mixture of a vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$; and

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group; and wherein the (A) polyolefin component is present in an amount of from 1 wt% to 25 wt%, based on the total weight of the curable composition.

2. A curable composition comprising (A) a polyolefin component comprising a telechelic polyolefin of the formula $A^1L^1L^2A^2$ that has a viscosity less than 100,000 cP; wherein the viscosity is a Brookfield viscosity (as measured at 177 °C) in accordance with ASTM-D3236 and (B) a curing component comprising a cross-linking agent, wherein:

L^1 is a polyolefin;

A^1 is selected from the group consisting of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylidene group of the formula $CH_2=C(Y^1)–$, a mixture of a vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$;

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group;

L^2 is a C_1 to C_{32} hydrocarbylene group; and

A^2 is a hydrocarbyl group comprising a hindered double bond; and wherein the (A) polyolefin component is present in an amount of from 1 wt% to 25 wt%, based on the total weight of the curable composition.

3. A curable composition comprising (A) a polyolefin component comprising an unsaturated polyolefin of the formula A^1L^1 that has a viscosity less than 100,000 cP and a telechelic polyolefin of the formula $A^1L^1L^2A^2$ that has a viscosity less than 100,000 cP; wherein the viscosity is a Brookfield viscosity (as measured at 177 °C) in accordance with ASTM-D3236 and (B) a curing component comprising a cross-linking agent, wherein:

L^1 at each occurrence independently is a polyolefin;

A^1 at each occurrence independently is selected from the group consisting of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylene group of the formula $Y^1CH=CH–$, a mixture of a vinyl group and a vinylidene group of the formula $CH_2=C(Y^1)–$, a mixture of a vinylidene group of the formula $CH_2=C(Y^1)–$ and a vinylene group of the formula $Y^1CH=CH–$, and a mixture of a vinyl group, a vinylidene group of the formula $CH_2=C(Y^1)–$, and a vinylene group of the formula $Y^1CH=CH–$;

Y^1 at each occurrence independently is a C_1 to C_{30} hydrocarbyl group;

L^2 is a C_1 to C_{32} hydrocarbylene group; and

A^2 is a hydrocarbyl group comprising a hindered double bond; and wherein the (A) polyolefin component is present in an amount of from 1 wt% to 25 wt%, based on the total weight of the curable composition.

4. The curable composition of claim 2 or 3, wherein the telechelic polyolefin has a weight average molecular weight from 1,000 to 40,000 g/mol.

5. The curable composition of claim 1 or 3, wherein the unsaturated polyolefin has a weight average molecular weight from 1,000 to 40,000 g/mol.

6. The curable composition of any of the previous claims, wherein the curable composition further comprises (C) an additive component and (D) an ethylene-based polymer.

7. The curable composition of claim 6, wherein the ethylene-based polymer is an ethylene/alpha-olefin copolymer or an olefin block copolymer.

8. The curable composition of any of the previous claims, wherein the (C) additive component comprises a blowing agent.

9. The curable composition of any of the previous claims, wherein the curable composition has a viscosity (at 100 rad/s and 130 °C) from less than or equal to 2800 Pa-s before curing and an MH-ML of greater than or equal to 3.0 dNm after curing at 180°C for 15 minutes.

10. The curable composition of any of claims 1-7, wherein the (B) curing component further comprises a coagent and a silane coupling agent.

11. The curable composition of any of claims 1-7 and 10, wherein the curable composition has a viscosity (at 100 rad/s and 110 °C) from less than or equal to 1100 Pa-s before curing and an MH-ML of greater than or equal to 2.6 dNm after curing at 150°C for 25 minutes.

12. The curable composition of any of claims 1 and 3-11, wherein L^1 of the unsaturated polyolefin of the formula A^1L^1 is covalently bonded to A^1 through a carbon-carbon single bond.

13. The curable composition of any of claims 2-12, wherein L^1 of the telechelic polyolefin of the formula $A^1L^1L^2A^2$ is covalently bonded to each of A^1 and L^2 through carbon-carbon single bonds, and wherein L^2 of the telechelic polyolefin of the formula $A^1L^1L^2A^2$ is covalently bonded to A^2 through a carbon-carbon single bond.

14. An article made from the curable composition of any of claims 1-9, 12, and 13, wherein the article is a crosslinked foam.

15. An article made from the curable composition of any of claims 1-7, and 10-13, wherein the article is an encapsulant film.