SUMMARY

[0006] The above and other needs are met by a polymeric composition according to the current disclosure.

[0006a] In one aspect of the present disclosure, there is provided a polymeric composition comprising:

from about 40 to about 99 weight percent of a first polymer; and

from about 1 to about 60 weight percent of polybutylene(succinate-co-adipate) ("PBSA").

[0006b] In another aspect of the present disclosure, there is provided a method for making a polymeric composition, comprising the steps of:

reacting 1,4-butanediol with succinic acid and adipic acid to form a pre-polymer;

polymerizing the pre-polymer in a condensation polymerization reaction to form polybutylene(succinate-co-adipate) ("PBSA"); and

blending a first polymer with the PBSA to form a polymeric composition, wherein the polymeric composition comprises from about 40 to about 99 weight percent of the first polymer; and from about 1 to about 60 weight percent of the PBSA.

[0006c] According to one embodiment, the polymeric composition includes from about 40 to about 99 weight percent of a first polymer; and from about 1 to about 60 weight percent of polybutylene(succinate-co-adipate) ("PBSA").

[0007] In certain embodiments of the polymeric composition, the first polymer is preferably selected from the group consisting of polyvinyl chloride, polylactic acid, polyhydroxy alkanoates, and mixtures thereof.

[0008] In some embodiments of the polymeric composition, the PBSA preferably has a weight average molecular weight from about 50,000 to about 200,000. More preferably, the PBSA has a weight average molecular weight from about 80,000 to about 120,000. Further, in certain embodiments, the PBSA preferably has a viscosity from about 15,000 to about 40,000 centipoise at a temperature of about 215 °C.

[0009] In some instances, the PBSA of the polymeric composition preferably has a melting point from about 20 °C to about 75 °C. More preferably, the PBSA has a melting point from about 25 °C to about 40 °C.

[0010] For certain embodiments of the polymeric composition, the PBSA is preferably made up of from about 40 to about 60 mole percent moieties derived from 1,4-butanediol, from about 10 to about 50 mole percent moieties derived from succinic acid, and from about 10 to about 50 mole percent moieties derived from adipic acid.

[0011] In certain embodiments of the polymeric composition, the polymeric composition includes from about 1 to about 10 weight percent of the PBSA. More preferably, the polymeric composition includes from about 50 to about 60 weight percent of the PBSA.

[0012] In some embodiments of the polymeric composition, the polymeric composition may also include also include at least one additive selected from the group consisting of fillers, pigments, stabilizers, co-stabilizers, secondary plasticizers, lubricants, impact modifiers, and viscosity reducers.

[0013] The present disclosure also provides a method for making a polymeric composition. In one embodiment, the method includes a first step of reacting 1,4-butanediol with succinic acid and adipic acid to form a pre-polymer. The method also includes a second step of polymerizing the pre-polymer in a condensation polymerization reaction to form polybutylene(succinate-co-adipate) ("PBSA"). This polymeric composition includes from about 40 to about 99 weight percent of the first polymer; and from about 1 to about 60 weight percent of the PBSA.

[0014] In certain embodiments of the method, the first polymer is preferably selected from the group consisting of polyvinyl chloride, polylactic acid, polyhydroxy alkanoates, and mixtures thereof.

[0015] In some embodiments of the method, the PBSA preferably has a weight average molecular weight from about 50,000 to about 200,000. More preferably, the PBSA has a weight average molecular weight from about 80,000 to about 120,000. Further, in certain embodiments, the PBSA preferably has a viscosity from about 15,000 to about 40,000 centipoise at a temperature of about 215 °C.

[0016] In some instances, the PBSA used in the method preferably has a melting point from about 20 °C to about 75 °C. More preferably, the PBSA has a melting point from about 25 °C to about 40 °C.

[0017] For certain embodiments of the method, the PBSA is preferably made up of from about 40 to about 60 mole percent moieties derived from 1,4-butanediol, from about 10 to about 50 mole percent moieties derived from succinic acid, and from about 10 to about 50 mole percent moieties derived from adipic acid.

[0018] In certain embodiments of the method, the polymeric composition includes from about 1 to about 10 weight percent of the PBSA. More preferably, the polymeric composition includes from about 50 to about 60 weight percent of the PBSA.

[0019] In certain embodiments of the method, the polymerization of the pre-polymer to form PBSA is carried out using a metal oxide or an organometal oxide catalyst. The metal in the metal oxide or organometal oxide catalyst is preferably selected from the group consisting of titanium, zirconium, tin, germanium, antimony, hafnium, and bismuth. For