CLAIMS

1. A biodegradable polymer blend composition wherein the composition comprises:

at least one base polymer material; wherein the base polymer material is poly(lactic acid), poly(glycolic acid), isomers or copolymers thereof; and

at least one additive polymer material; wherein the additive polymer material is poly (lactide-co-caprolactone), poly(lactide-co-trimethylene carbonate), poly(lactide-co-dioxanone), poly (glycolide -co-caprolactone), poly(glycolide -co-trimethylene carbonate), poly(glycolide -co-dioxanone), isomers, or copolymers thereof.

2. The composition of claim 1, wherein the base polymer material is between 1wt% and 50wt%, and wherein the additive polymer material is between 50wt% and 99wt%.

3. The composition of claim 1 or 2, wherein the base polymer material, and additive polymer material

i) are miscible; and/or

ii) are blended together through melt processing into a multicomponent material.

4. The composition of claims 1 to 3, wherein the composition

i) has a temperature of melting lower than the base polymer; and/or

ii) has a melt temperature of about 150°C to about 200°C; and/or

iii) has an inherent viscosity of about 1.5dL/g to about 4.5dL/g; and/or

iv) has an elongation at break ranging from 10% to 200%; and/or

v) has cold-bendable properties at room temperature; and/or

vi) retains at least 70% of its initial elongation at break properties after aging for 12 weeks; and/or

vii) has a greater resistance to pH changes and loss of mechanical properties when compared to the base polymer throughout accelerated degradation.

5. The composition of claims 1 to 4, wherein the composition

i) can be processed into drawn monofilament and multifilament fibers; or

ii) is formed into a semi-finished or finished medical device article; or

iii) is processed into pellets, filaments, rods, or sheets; or

iv) is processed by drawing into tubes or films; or

v) is used to form an article, and wherein the article is annealed.

6. An article obtained by the composition of of claim 5, wherein the article is annealed or wherein the article is annealed at a temperature above the glass transition of the base polymer.

7. A biodegradable polymer blend composite composition for medical device applications wherein the polymer blend composite comprises:

a. the composition of claim 1; and

b. an additive material, wherein the additive material is particles, fibers, whiskers, inorganic additive, radiopaque materials, bioglass or combinations thereof.

8. The composition of claim 7, wherein the composition of claim 1 is between 50wt% and 95wt%, and wherein the additive material is between 5wt% and 50wt%.

9. The composition of claim 7 or 8, wherein the additive material is inorganic additive; wherein the inorganic additive is apatites, calcium phosphates, calcium sulfates, inorganic salts, or any combination thereof.

10. A fiber reinforced biodegradable polymer blend composite composition, wherein the fiber reinforced biodegradable polymer blend composite composition comprises:

a. the composition of claim 1 or 7;

b. fibers; and wherein the fibers is selected from the group consisting of poly(lactic acid), poly(glycolic acid), poly(lactide-co-glycolide), poly(caprolactone), poly(vinyl alcohol), polyether ether ketone (PEEK), polyethylene terephthalate (PET), polybutylene terephthalate (PBT), polyethylene (PE), silk, chitin, collagen, elastin, magnesium and magnesium alloys, or combinations thereof.

11 The composition of claim 10, wherein the composition of claim 1 is between 50wt% and 99wt%; and wherein the fibers is between 1wt% and 50wt%.

12. The composition of claim 10 or 11, wherein the fibers

i) are continuous fibers, or chopped fibers; or

ii) the fibers have a diameter of less than 100μm; or

iii) are chopped fibers having a length of about 1mm to 30mm; or

iv) are blended with the composition of claim 1 or 7 through melt processing; or

v) increase the composite tensile strength and elastic modulus when compared to the composition of claim 1.

13. The composition of claim 10 or 11, wherein the composition

i) is manufactured into a finished or semi-finished medical device article; or

ii) is processed into pellets, filaments, rods, or sheets; or

iii) is processed by drawing into tubes or films; or

iv) is drawn into monofilament or multifilament fibers.

14. A biodegradable color polymer blend composition comprising:

a. the composition of claim 1, 7 or 10; and

b. a coloring agent.

15. The composition of claim 14, wherein the coloring agent

i) is not less than 0.001wt%; and/or

ii) is monosodium salt of 2-[(9,10-dihydro-4-hydroxy -9,10-dioxo-1-anthracenyl) amino]-5-methyl-benzenesulfonic acid (D&C Violet NO. 2), D&C Blue NO. 6, or D&C Green NO. 6.

16. A process for making an article containing the composition of claims 1, 7, 10, or 14 comprising the steps of:

a) mixing base polymer material and an additive polymer material to form a mixture;

b) feeding the mixture into a twin-screw extruder;

c) melting the mixture in the twin-screw extruder to form a extrudate;

d) forming pellets from the extrudate; and

e) injection molding of the extruded pellets into an article.

17. A process for making a filament containing the composition of any preceding claim, comprising the steps of:

a) mixing of the individual components;

b) feeding the mixture into a twin-screw extruder;

c) melting the mixture in the twin-screw extruder to form an extrudate;

d) pulling the extrudate to form a filament.