CLAIMS

1. A process of depolymerizing a polyester of a dicarboxylic acid, the process comprising:

depolymerizing the polyester in the presence of a first base and a solvent mixture to selectively yield a mono-salt product of a monoester of said dicarboxylic acid;

wherein said solvent mixture comprises at least one aprotic solvent and at least one protic solvent; and

wherein the aprotic solvent and protic solvent are provided in a volume ratio of from 1:10 to 100:1.

2. The process of claim 1, wherein the polyester is selected from the group consisting of polyethylene terephthalate (PET), polybutylene terephthalate (PBT), polytrimethylene terephthalate (PTT), polyethylene naphthalate (PEN), block copolymer of forgoing polyesters, substituted foregoing polyesters, branched forgoing polyesters and mixtures thereof.

3. The process of claim 1, wherein the aprotic and protic solvents are provided in a volume ratio of 1:1 to 15:1.

4. The process of claim 1, wherein the aprotic solvent comprises at least one polar aprotic solvent selected from the group consisting of acetonitrile, tetrahydrofuran, acetone, dimethyl formamide, and dimethyl sulfoxide; and/or at least one non-polar aprotic solvent selected from the group consisting of toluene, dichloromethane, chlorobenzene, xylene, diethyl ether, and combinations thereof.

5. The process of claim 1, wherein the aprotic solvent is selected from the group consisting of tetrahydrofuran, acetonitrile, dichloromethane, diethyl ether, and mixtures thereof.

6. The process of claim 1, wherein the protic solvent is selected from the group consisting of methanol, ethanol, 2-fluoroethanol, 2-chloroethanol, 2,2,2-trichloroethanol, n-propanol, isopropanol, n-butanol, tert-butanol, allyl alcohol, propargyl alcohol, 2-aminoethanol, 2-dimethylaminoethanol, ethylene glycol, propylene glycol, 1,4-butanediol, and mixtures thereof.

7. The process of claim 1, wherein the protic solvent is selected from the group consisting of methanol, ethanol, allyl alcohol and mixtures thereof.

8. The process of claim 1, wherein the mole ratio of the first base to a repeating monomer unit of the polyester is from 0.5 to 2.

9. The process of claim 1, wherein the mole ratio of the first base to a repeating monomer unit of the polyester is from 1 to 1.5.

10. The process of claim 1, wherein the first base comprises at least one inorganic base, at least one organic base, or a mixture thereof.

11. The process of claim 10, wherein the inorganic base is selected from the group consisting of alkali metal hydroxide, alkaline earth metal hydroxide, ammonium hydroxide, and mixtures thereof.

12. The process of claim 11, wherein the inorganic base is selected from the group consisting of potassium hydroxide, sodium hydroxide, and mixtures thereof.

13. The process of claim 10, wherein the organic base is selected from the group consisting of metal salt of methoxide, metal salt of ethoxide, metal salt of n-propoxide, metal salt of iso-propoxide, metal salt of n-butoxide, metal salt of tert-butoxide, and mixtures thereof.

14. The process of claim 13, wherein the metal is selected from alkali metal or alkaline earth metal.

15. The process of claim 13, wherein the organic base is selected from the group consisting of potassium methoxide, potassium ethoxide, potassium n-propoxide, potassium iso-propoxide, potassium n-butoxide, potassium tert-butoxide, sodium methoxide, sodium ethoxide, sodium n-propoxide, sodium iso-propoxide, sodium n-butoxide, sodium tert-butoxide, and mixtures thereof.

16. The process of claim 1, wherein said depolymerizing is performed at a temperature ranging from 10 °C to 90 °C.

17. The process of claim 1, wherein said depolymerizing is performed at a temperature ranging from 22 °C to 55 °C.

18. The process of claim 1, wherein said depolymerizing is undertaken for a time period from 10 minutes to 10 hours or from 30 minutes to 5 hours.

19. The process of claim 1, further comprising a step of separating the mono-salt product as solid precipitates.

20. The process of claim 19, further comprising reacting the mono-salt product with an acid solution to produce a monoester of said dicarboxylic acid, wherein the acid solution is selected from the group consisting of hydrochloric acid (HCl), sulfuric acid (H_2SO_4), phosphoric acid (H_3PO_4), acetic acid, formic acid, citric acid and mixtures thereof.

21. The process of claim 20, wherein the mono-salt product is acidified until a pH value of from 0.1 to 3.

22. The process of claim 20, wherein said reacting step of the mono-salt product with an acid solution, is performed at a temperature ranging from 18 °C to 40 °C.

23. The process of claim 19, further comprising a step of reacting the mono-salt product with a second base to produce a dicarboxylic salt.

24. The process of claim 23, wherein the second base is an inorganic base selected from the group consisting of alkali metal hydroxide, alkaline earth metal hydroxide, ammonium hydroxide, and mixtures thereof.

25. The process of claim 23, wherein the second base is an inorganic base selected from potassium hydroxide, sodium hydroxide, and mixtures thereof.

26. The process of claim 23, further comprising reacting the said dicarboxylic salt with an acid solution to produce a dicarboxylic acid, wherein the acid solution is selected from the group consisting of hydrochloric acid (HCl), sulfuric acid (H_2SO_4), phosphoric acid (H_3PO_4), acetic acid, formic acid, citric acid and mixtures thereof.