CLAIMS

What is claimed is:

1. A method for processing waste plastic, said method comprising:

(a) withdrawing a reactor purge coproduct stream from a solvolysis facility used to process PET-containing waste plastic; and

(b) introducing at least a portion of said reactor purge coproduct stream into at least one of the following: (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; (iii) a cracker facility; and (iv) an energy generation/energy production facility.

2. The method of claim 1, wherein said withdrawing is performed in a continuous manner.

3. The method of claim 1, wherein said withdrawing is performed in a batch manner.

4. The method of claim 1, wherein said solvolysis facility produces a principal terephthalyl and a principal glycol and wherein said reactor purge coproduct stream has a mid-range boiling point higher than the boiling point of said principal terephthalyl.

5. The method of claim 1, further comprising introducing another coproduct stream from said solvolysis facility into at least one of the following: (i) a partial oxidation (POX) facility; (ii) a pyrolysis facility; (iii) a solidification facility; (iv) a cracker facility; and (v) an energy generation/energy production facility.

6. The method of claim 5, wherein said reactor purge coproduct stream and said another coproduct stream are introduced into different ones of (i) through (v).

7. The method of claim 1, wherein at least a portion of said reactor purge coproduct stream is introduced into a POX gasification facility.

8. The method of claim 7, wherein said POX gasification facility includes a liquid-fed gasifier.

9. The method of claim 7, wherein said POX gasification facility includes a solid-fed gasifier.

10. A method for processing waste plastic, said method comprising:

(a) separating a stream of mixed plastic waste (MPW) into a polyethylene terephthalate-enriched (PET-enriched) stream and a polyolefin-enriched stream (PO-enriched) stream;

(b) subjecting at least a portion of said PET-enriched stream to solvolysis in a solvolysis facility to form a principal glycol product, a principal terephthalyl product, and at least one coproduct stream, wherein said coproduct stream comprises a reactor purge coproduct stream; and

(c) introducing at least a portion of said coproduct stream from said solvolysis facility into at least one of the following: (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; (iii) a solidification facility; (iv) a cracker facility; and (v) an energy generation/energy production facility.

11. The method of claim 10, wherein said PET-enriched stream comprises at least 60 weight percent PET and not more than 40 weight percent of polyolefins, based on the total weight of the PET-enriched stream, wherein said PO-enriched stream comprises at least 60 weight percent polyolefins and not more than 40 weight percent of PET, based on the total weight of the PO-enriched stream, and wherein said PET-enriched stream comprises not more than 10 weight percent of halogens, based on the total weight of the PET-enriched stream.

12. The method of claim 10, wherein said reactor purge coproduct stream has a temperature in the range of from 200 to 350°C when withdrawn from said solvolysis facility.

13. The method of claim 10, wherein said introducing is performed in a continuous manner.

14. The method of claim 20, wherein said introducing is performed in a batch manner.

15. The method of claim 20, wherein said solvolysis facility comprise a methanolysis facility.

16. The method of claim 20, further comprising introducing said reactor purge coproduct stream into at least two of facilities (i) through (v).

17. A solvolysis coproduct composition formed within a solvolysis facility for processing polyester-containing waste plastic into a principal glycol and a principal terephthalyl using a principal solvent, said composition comprising:

at least 25 weight percent of said principal terephthalyl, based on the total weight of said composition; and

an amount of 100 ppm by weight to 25 percent by weight of one or more non-terephthalyl solids, based on the total weight of said composition.

18. The composition of claim 17, wherein said solvolysis coproduct composition comprises dimethyl terephthalate in an amount of at least 10 weight percent, based on the total weight of said composition.

19. The composition of claim 17, wherein said solvolysis coproduct composition has a viscosity of at least 0.01 poise (P), measured using a Brookfield R/S rheometer with V80-40 vane spindle operating at a shear rate of 10 rad/s and a temperature of 250°C, wherein said solvolysis coproduct composition comprises at least about 100 ppm and/or not more than 60,000 ppm of non-volatile catalyst compounds selected from the group consisting of titanium, zinc, methoxide, alkali metals, alkaline earth metals, tin, residual esterification catalysts, residual polycondensation catalysts, aluminum, and combinations thereof.

20. The composition of claim 17, wherein said solvolysis coproduct composition has a total solids content of at least about 100 weight percent and not more than about 25 weight percent.