CLAIMS

What is claimed is –

1. A method for processing waste polymer materials, said method comprising

(a) introducing a feed stream comprising waste automotive carpet material into a solvolysis facility,

wherein said waste automotive carpet material comprises at least 50 weight percent polyester, based on the total weight of said waste automotive carpet material,

wherein said waste automotive carpet material comprises not more than 25 weight percent of polymeric components other than polyester based on the total weight of said waste automotive carpet material, wherein said polymeric components other than polyester are selected from the group consisting of polyamides, polyolefins, acrylics, cellulose acetate, wool, and cotton, or wherein said polymeric components other than polyester comprise at least one of nylon 6, nylon 6,6, polypropylene, polyethylene, and poly(ethylene-co-vinyl acetate),

wherein said automotive carpet waste material comprises adhesive material in an amount in the range of from 0.1 to 15 weight percent, based on the total weight of said automotive carpet waste material,

wherein said waste automotive carpet material comprises at least 0.01 and not more than 5 weight percent of one or more fillers, based on the total weight of said waste automotive carpet material, wherein said fillers comprise at least one of calcium carbonate, barium sulfate, and titanium dioxide, and/or

wherein said waste automotive carpet material comprises carbon black; and

wherein said solvolysis facility is a methanolysis facility.

2. The method of claim 1, further comprising:

(b) subjecting said feed stream to solvolysis to provide a principal terephthalyl, a principal glycol, and at least one coproduct stream.

3. The method of claim 2, further comprising:

(c) introducing at least a portion of said coproduct stream into at least one of the following chemical processing facilities or zones: (i) a partial oxidation gasification facility; (ii) a pyrolysis facility; (iii) a cracking facility; (iv) an energy recovery facility; and (v) a liquification zone.

4. The method of any one of claims 1-3, wherein said waste automotive carpet material comprises fibers of waste automotive carpet material.

5. The method of any one of claims 1-3, wherein said waste automotive carpet material comprises material from carpet tufts, carpet backing, adhesives, and combinations thereof.

6. The method of any one of claims 1-3, wherein said waste automotive carpet material comprises not more than 20 weight percent of carpet fibers.

7. The method of any one of claims 1-3, wherein said waste automotive carpet material comprises densified waste automotive carpet material.

8. The method of any one of claims 1-3, wherein said waste automotive carpet material comprises particulates having a D90 of at least 0.1 and not more than 10 mm.

9. The method of any one of claims 1-3, wherein said feed stream comprises said waste automotive carpet material in an amount in the range of from 10 to 30 weight percent, based on the total weight of said feed stream.

10. The method of any one of claims 1-3, wherein at least 5 and not more than 99 weight percent of said waste automotive carpet material is post-consumer waste material, based on the total weight of said waste automotive

carpet material or wherein at least 5 and not more than 99 weight percent of said waste automotive carpet material is pre-consumer waste material, based on the total weight of said waste automotive carpet material, and wherein said feed stream further comprises waste plastic in an amount of at least about 5 and not more than 99 weight percent based on the total weight of said feed stream.

11. The method of claim 10, wherein said waste plastic includes at least 5 and not more than 95 weight percent of polyethylene terephthalate, based on the total weight of said feed stream or wherein said waste plastic includes at least 10 and not more than 80 weight percent of polyolefin, based on the total weight of said feed stream or wherein said waste plastic includes at least 0.001 and not more than 10 weight percent of halogens on a dry basis, based on the total weight of plastics in said feed stream.

12. The method of claim 2 or 3, wherein said introducing of said feed stream comprises dissolving at least a portion of said waste automotive carpet material with a solvolysis solvent in a blending zone of said solvolysis facility to form a predominantly liquid feed stream and subjecting at least a portion of said predominantly liquid feed stream to solvolysis.

13. The method of claim 2 or 3, further comprising purging at least a portion of said coproduct stream from said solvolysis facility and wherein said purging is carried out continuously.

14. The method of any one of claims 1-3, wherein said methanolysis facility is co-located with at least one of (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; (iii) a cracking facility; (iv) an energy recovery facility; and (v) a liquification zone, wherein said methanolysis facility is operated in a continuous manner, and wherein said methanolysis facility has an average feed rate of at least 500 pounds per hour, averaged over one year.

15. A solvolysis composition comprising:

waste plastic comprising polyethylene terephthalate (PET), polyolefin (PO), and polyvinyl chloride (PVC);

waste automotive carpet material; and

a solvolysis solvent in which said waste plastic and said waste automotive carpet material are at least partially dissolved,

wherein said waste automotive carpet material comprises at least 50 weight percent polyester, based on the total weight of said waste automotive carpet material,

wherein said waste automotive carpet material comprises not more than 25 weight percent of polymeric components other than polyester based on the total weight of said waste automotive carpet material, wherein said polymeric components other than polyester are selected from the group consisting of polyamides, polyolefins, acrylics, cellulose acetate, wool, and cotton, or wherein said polymeric components other than polyester comprise at least one of nylon 6, nylon 6,6, polypropylene, polyethylene, and poly(ethylene-co-vinyl acetate),

wherein said automotive carpet waste material comprises adhesive material in an amount in the range of from 0.1 to 15 weight percent, based on the total weight of said automotive carpet waste material,

wherein said waste automotive carpet material comprises at least 0.01 and not more than 5 weight percent of one or more fillers, based on the total weight of said waste automotive carpet material, wherein said fillers comprise at least one of calcium carbonate, barium sulfate, and titanium dioxide, and/or

wherein said waste automotive carpet material comprises carbon black; and

wherein said solvolysis solvent is methanol.

16. The solvolysis composition of claim 15, wherein said waste plastic is present in an amount in the range of from 10 to 95 weight percent, based on the total weight of said solvolysis composition,

or wherein said PO is present in an amount in the range of from 10 to 80 weight percent, based on the total weight of said solvolysis composition,

or wherein said PVC is present in an amount in the range of from 0.1 to 8 weight percent, based on the total weight of said waste plastic.