CLAIMS

What is claimed is –

1. A method of making a pyrolysis oil, said method comprising:

(a) introducing a pyrolysis feed and a reducing gas stream into a pyrolysis unit, wherein said pyrolysis feed comprises at least one recycled waste; and

(b) pyrolyzing at least a portion of said pyrolysis feed to thereby form a pyrolysis effluent comprising a pyrolysis oil, wherein said pyrolysis oil -

(i) comprises an aromatic content of less than 15 weight percent;

(ii) comprises an alkane content of at least 25 weight percent; and

(iii) exhibits a density at 15°C of less than 0.9 g/cm^3.

2. The method according to claim 1, wherein said recycled waste comprises post-consumer waste and/or post-industrial waste.

3. The method according to claim 2, wherein said post-consumer waste comprises a waste plastic, a waste rubber, a textile, modified cellulose, wet-laid products, or combinations thereof.

4. The method according to claim 2, wherein said pyrolysis feed comprises at least 30, weight percent of at least one post-consumer wastes.

5. The method according to claim 1, wherein said recycled waste comprises at least one recycled waste plastic.

6. The method according to claim 5, wherein said pyrolysis feed comprises at least 30 weight percent of at least one recycled waste plastic.

7. The method according to claim 1, wherein said reducing gas stream comprises hydrogen, carbon monoxide, or a combination thereof.

8. The method according to claim 1, wherein said pyrolysis oil comprises an aromatic content of less than 15 weight percent.

9. The method according to any one of claims 1 or 8, wherein said pyrolysis oil comprises an alkane content of at least 25weight percent.

10. The method according to any one of claims 1 or 9, wherein said pyrolysis oil exhibits a density at 15°C of less than 0.85 g/cm^3.

11. The method according to claim 1, wherein said reducing gas stream comprises at least 2 weight percent of at least one reducing gas.

12. The method according to claim 1, wherein said reducing gas stream comprises at least 40 weight percent of hydrogen.

13. The method according to claim 12, wherein said reducing gas stream comprises less than 99 weight percent of hydrogen.

14. The method according to claim 1, wherein said pyrolyzing of step (b) occurs in the absence of a pyrolysis catalyst.

15. The method according to claim 1, wherein said pyrolyzing of step (b) occurs in the absence of a catalytic cracking catalyst and/or a hydrocracking catalyst.

16. The method according to claim 1, wherein said pyrolyzing of step (b) occurs in the presence of a hydrogenation catalyst.

17. The method according to claim 1, wherein said reducing gas stream is effective to remove at least 10 percent of the nitrogen and/or chlorine originally present in said recycled waste.

18. A method of making a pyrolysis oil, said method comprising:

(a) introducing a pyrolysis feed and a steam-containing stream into a pyrolysis unit, wherein said pyrolysis feed comprises at least one recycled waste; and

(b) pyrolyzing at least a portion of said pyrolysis feed to thereby form a pyrolysis effluent comprising a pyrolysis oil, wherein said pyrolysis oil -

(i) comprises an aromatic content of less than 25 weight percent;

(ii) comprises an alkane content of at least 25 weight percent; and

(iii) exhibits a density at 15°C of less than 0.9 g/cm^3.

19. The method according to claim 18, wherein said recycled waste comprises post-consumer waste and/or post-industrial waste.

20. The method according to claim 19, wherein said post-consumer waste comprises a waste plastic, a waste rubber, a textile, modified cellulose, wet-laid products, or combinations thereof.