CLAIMS

What is claimed is –

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

(a) introducing a pyrolysis feed 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 in the absence of a ZSM-5 catalyst to thereby form a pyrolysis effluent comprising at least 20 weight percent of a pyrolysis gas,
wherein said recycled waste is a waste that is reusable in a production process,
wherein said pyrolysis gas comprises a combined C3/C4 hydrocarbon content of at least 25 weight percent, and
wherein said pyrolysis effluent comprises an aromatic content of less than 15 weight percent.

2. The method of claim 1, wherein said pyrolyzing of step (b) occurs at a temperature of at least 550°C and/or not more than 1,100°C.

3. The method according to claim 1 or 2, wherein said recycled waste comprises waste resulting from consumer activities and/or industrial activities.

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

5. The method according to claim 3 or 4, wherein said pyrolysis feed comprises at least 30 weight percent of at least one, two, three, or four wastes resulting from consumer activities.

6. The method according to any one of claims 1-5, wherein said recycled waste comprises at least one recycled waste plastic.

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

8. The method according to claim 6, wherein said pyrolysis feed comprises at least 30 weight percent of polyethylene and/or polypropylene.

9. The method according to claim 1 or 2, wherein said pyrolysis effluent comprises at least 40 weight percent of a pyrolysis oil.

10. The method according to any one of claims 1-9, wherein said pyrolysis effluent comprises a combined C3/C4 hydrocarbon content of at least 10 weight percent.

11. The method according to any one of claims 1-10, wherein said pyrolysis effluent comprises at least 20 weight percent of said pyrolysis gas.

12. The method according claim 11, wherein said pyrolysis gas comprises a C3 hydrocarbon content of at least 1 weight percent.

13. The method according to claim 11 or 12, wherein said pyrolysis gas comprises a C4 hydrocarbon content of at least 1weight percent.

14. The method according to any one of claims 11-13, wherein said pyrolysis gas comprises a combined C3/C4 hydrocarbon content of at least 20 weight percent.

15. The method according to any one of claims 1-14, wherein said pyrolyzing of step (b) occurs in the absence of a pyrolysis catalyst.

16. The method according to any one of claims 1-15, wherein said pyrolyzing of step (b) occurs in a pyrolysis unit, wherein said pyrolysis unit comprises a fluidized bed reactor, a transported bed reactor, an ablative (vortex) reactor, an extruder reactor, a microwave reactor, a fixed bed reactor, a vacuum reactor, an autoclave reactor, a rotary kiln, or a tubular reactor.

17. The method according to any one of claims 1-16, wherein said pyrolyzing of step (b) occurs at a residence of at least 0.1 seconds and less than 10 seconds.

18. The method according to any one of claims 1-14 or 16-17, wherein said pyrolyzing of step (b) occurs in the presence of a pyrolysis catalyst.