CLAIMS

What is claimed is –

1. A process for making olefins and a cracked gasoline stream, said process comprising:

(a) cracking a cracker feed stream comprising a recycle content pyrolysis oil composition (r-pyoil) and a non-recycle content C2 to C4 composition in a cracker furnace to provide an olefin-containing effluent stream; and

(b) separating said olefin-containing effluent stream in at least one separator downstream of said cracker furnace to provide a light fraction and a heavy fraction, wherein said heavy fraction comprises a recycle content cracked gasoline composition (r-pyrolysis gasoline).

2. A process for making olefins and a cracked gasoline stream, said process comprising:

(a) separating a column feed stream in at least one separator to provide a light fraction and a heavy fraction, wherein said column feed stream comprises a recycle content hydrocarbon composition (r-hydrocarbon); and

(b) recovering a product stream comprising recycle content cracked gasoline composition (r-pyrolysis gasoline) from said heavy fraction.

3. A composition comprising a recycle content pyrolysis gasoline composition (r-pyrolysis gasoline) formed by the process of any of claims 1 and 2 above.

4. A system for carrying out the process of any of claims 1 or 2.

5. The process, system or composition of any of claims 1-4, further comprising a recovering an olefin stream comprising a recycle content olefin (r-olefin) from said light fraction.

6. The process, system or composition of any of claims 1-5, wherein said r-olefin comprises predominantly r-ethylene.

7. The process, system or composition of any of claims 6, wherein said r-olefin comprises predominantly r-propylene.

8. The process, system or composition of any of claims 1-2, wherein the mass flow rate of dienes in said heavy fraction is at least 0.1% higher than the mass flow rate of dienes in said heavy fraction if the cracker feed stream did not include r-pyoil, but at the same flow rate and all other conditions being identical.

9. The process, system or composition of any of claims 8, wherein the mass flow rate of dienes in said heavy fraction is at least 0.1% higher than the mass flow rate of dienes in said heavy fraction if the column feed stream did not include r-hydrocarbon, but at the same flow rate.

10. The process, system or composition of any of claims 9, wherein said r-pyrolysis gasoline is present in said heavy fraction in an amount at least 1 and/or not more than 99 weight percent, based on the total weight of said heavy fraction.

11. The process, system or composition of any of claims 10, wherein said heavy fraction comprises dienes in an amount of at least 0.01 weight percent, based on the total weight of said heavy fraction.

12. The process, system or composition of any of claims 11, wherein said dienes comprise C4 to C12 dienes.

13. The process, system or composition of any of claims 12, wherein said dienes comprise straight chain dienes, cyclic dienes, or combinations thereof.

14. The process, system or composition of any of claims 13, wherein said dienes comprise butadiene, cyclopentadiene, dicyclopentadiene, and combinations thereof.

15. The process, system or composition of any of claims 1, wherein at least 5 percent of the total amount of dienes comprise butadiene.

16. The process, system or composition of any of claims 1, wherein at least 5 percent of the total amount of dienes comprise cyclopentadiene.

17. The process, system or composition of any of claims 16, wherein at least 5 percent of the total amount of dienes comprise dicyclopentadiene.

18. The process, system or composition of any of claims 17, wherein said composition comprises at least 1 and/or not more than 99 weight percent of said r-pyrolysis gasoline, based on the total weight of said composition.

19. The process, system or composition of any of claims 18, further comprising separating said heavy fraction in a column to form a light gasoline stream and a heavy gasoline stream, wherein at least one of the light gasoline stream and the heavy gasoline stream comprise at least a portion of said r-pyrolysis gasoline.

20. The process, system or composition of any of claims 19, further comprising at least a portion of said light gasoline stream and/or said heavy gasoline stream to form a hydrocarbon product.