

CLAIMS:

1. A method for producing a naphtha product and an unconverted product, comprising:
 - exposing a feedstock comprising an atmospheric gas oil, a virgin distillate or a hydrotreated virgin distillate having a boiling range in which at least 90 wt% boils above 350°F to a first hydrocracking catalyst under first effective ~~hydroprocessing~~ hydrocracking conditions to form a first hydrocracked effluent, the feedstock having a cetane number of about 35 or less, at least about 60 wt% of the feedstock boiling above about 400°F (about 204°C) and at least about 60 wt% of the feedstock boiling below about 650°F (about 343°C);
 - exposing the first hydrocracked effluent, without intermediate separation, to a first dewaxing catalyst comprising Pt-ZSM-48 under first effective dewaxing conditions to form a first dewaxed effluent;
 - separating the dewaxed effluent to form a first gas phase portion and a first liquid phase portion;
 - fractionating the first liquid phase portion and a second liquid phase portion in a first fractionator to form at least one naphtha fraction and an unconverted fraction, the naphtha fraction corresponding to at least about 65 wt% of the feedstock and having a final boiling point of about 400°F (about 204°C) or less;
 - withdrawing at least a first portion of the unconverted fraction as an unconverted product stream, the weight of the unconverted product stream corresponding to from about 5 wt% to about 35 wt% of the feedstock; wherein the unconverted product stream has an initial boiling point of at least about 400°F (about 204°C), a cetane number of at least about 45, and a cloud point at least about 10°F (about 6°C) less than the cloud point of the feedstock;
 - exposing at least a second portion of the unconverted fraction to a second hydrocracking catalyst under second effective ~~hydroprocessing~~ hydrocracking conditions less severe than the first hydrocracking conditions to form a second hydrocracked effluent;
 - exposing the second hydrocracked effluent, without intermediate separation, to a second dewaxing catalyst under second effective dewaxing conditions to form a second dewaxed effluent;
 - separating the second ~~hydrocracked~~ dewaxed effluent to form a second gas phase portion and the second liquid phase portion; and
 - sending at least a portion of the second liquid phase portion to the first fractionator.

2. The method of claim 1, wherein at least about 80 wt% of the feedstock boils below about 700°F (about 371°C).
3. The method of claim 1, wherein the weight of the unconverted product stream corresponds to ~~less than~~ from about 5 wt% to about 25 wt% of the feedstock.
4. The method of claim 3, wherein the cloud point of the unconverted product stream is at least about 20°F (about 11°C) less than the cloud point of the feedstock.
5. The method of claim 1, wherein the unconverted product stream has a cetane number of at least about 50.
6. The method of claim 1, wherein the unconverted product stream has a T10 boiling point of at least about 425°F (about 218°C).
7. The method of claim 1, wherein the T90 boiling point of the unconverted product stream is about 700°F (about 371°C) or less.
8. The method of claim 1, wherein about 25 wt% or less of the unconverted product stream boils above about 600°F (about 316°C).
- ~~9. The method of claim 1, wherein the first effective hydroprocessing conditions are selected from effective hydrocracking conditions or effective hydrotreating conditions.~~
- ~~10.~~ 9. The method of claim 1, wherein during exposing of the first hydrocracked effluent to the first dewaxing catalyst, the space velocity of the first hydrocracked effluent relative to the first dewaxing catalyst is at least about 15 hr⁻¹.
- ~~11.~~ 10. The method of claim 1, further comprising quenching the first hydrocracked effluent prior to exposing the first hydrocracked effluent to the first dewaxing catalyst.
- ~~12. The method of claim 1, wherein the first dewaxing catalyst comprises ZSM-48, ZSM-23, zeolite Beta, or a combination thereof.~~

13. — The method of claim 1, further comprising exposing the second hydrocracked effluent to a second dewaxing catalyst under second effective catalytic dewaxing conditions.

14.11. The method of claim 1, wherein the weight of the naphtha fraction corresponds to at least about 75 wt% of the feedstock.

15. — A method for producing an improved octane naphtha product stream, comprising:
—— exposing a light cycle oil from a fluid catalytic cracking process to a first hydrocracking catalyst under first effective hydroprocessing conditions to form a first hydrocracked effluent, the light cycle oil having a cetane number of about 35 or less, at least about 60 wt% of the feedstock boiling above about 400°F (about 204°C) and at least about 60 wt% of the feedstock boiling below about 650°F (about 343°C);
—— exposing the first hydrocracked effluent, without intermediate separation, to a first dewaxing catalyst under first effective dewaxing conditions to form a dewaxed effluent;
—— separating the dewaxed effluent to form a first gas phase portion and a first liquid phase portion;
—— fractionating the first liquid phase portion and a second liquid phase portion in a first fractionator to form at least one naphtha fraction and an unconverted fraction, the naphtha fraction corresponding to at least about 65 wt% of the feedstock and having a final boiling point of about 400°F (about 204°C) or less;
—— withdrawing at least a portion of the unconverted fraction as an unconverted product stream, the weight of the unconverted product stream corresponding to from about 5 wt% to about 35 wt% of the light cycle oil; wherein the unconverted product stream has an initial boiling point of at least about 400°F (about 204°C), a cetane number of at least about 45, and a cloud point at least about 10°F (about 6°C) less than the cloud point of the light cycle oil;
—— exposing at least a second portion of the unconverted fraction to a second hydrocracking catalyst under second effective hydroprocessing conditions to form a second hydrocracked effluent;
—— separating the second hydrocracked effluent to form a second gas phase portion and the second liquid phase portion;
 sending at least a portion of the second liquid phase portion to the first fractionator;
and

—sending the at least one naphtha fraction to a reformer unit and producing an improved naphtha product stream, wherein the improved naphtha product stream has a higher octane value (RON+MON) than the naphtha fraction.

16. —The method of claim 15, wherein the weight of the unconverted product stream corresponds to less than about 25 wt% of the light cycle oil.

17. —The method of claim 16, wherein the cloud point of the unconverted product stream is at least about 20°F (about 11°C) less than the cloud point of the light cycle oil.

18. —The method of claim 15, wherein the unconverted product stream has a cetane number of at least about 50.

19. —The method of claim 15, wherein during exposing of the first hydrocracked effluent to the first dewaxing catalyst, the space velocity of the first hydrocracked effluent relative to the first dewaxing catalyst is at least about 15 hr⁻¹.

20. —The method of claim 15, wherein the weight of the naphtha fraction corresponds to at least about 75 wt% of the light cycle oil.