

Claims

~~1. A method for manufacturing an alcohol-gasoline blend from a hydrocarbon Basestock for Oxygenate Blending (BOB) which is blended with an alcohol to a required BOB-alcohol blend octane specification, which comprises:~~

~~blending a hydrocarbon BOB to an optimized BOB blend recipe which is (i) formulated to provide a BOB octane (RON, MON, and/or $(R+M)/2$) which will meet the octane specification required for the BOB-alcohol blend when the BOB is blended with the alcohol, and (ii) based on the effect of BOB sensitivity (RON-MON) on the octane boost resulting from the addition of the alcohol to the BOB;~~

~~blending the BOB with an alcohol to form the alcohol-BOB blend conforming to the required octane specification.~~

~~2. A method according to claim 1 which comprises:~~

~~determining the octane sensitivity (RON-MON) of the BOB,~~

~~blending the BOB to an octane number, $(RON+MON)/2$, determined by the octane sensitivity (RON-MON) of the BOB,~~

~~blending the alcohol with the BOB to form the alcohol-gasoline blend conforming to the required octane specification.~~

~~3. A method for manufacturing a hydrocarbon Basestock for Oxygenate Blending (BOB) which is to be blended with an alcohol to a required BOB-alcohol blend octane specification, which comprises:~~

~~blending a hydrocarbon BOB to an optimized BOB blend recipe which is (i) formulated to provide a BOB octane (RON, MON, and/or $(R+M)/2$) which will meet the octane specification required for the BOB-alcohol blend when the BOB is blended with the alcohol, and (ii) based on the effect of BOB sensitivity (RON-MON) on the octane boost resulting from the addition of the alcohol to the BOB.~~

~~4. A method according to claim 3 in which the pre-determined octane specification of the alcohol-BOB blend is the Anti-Knock Index/Pump Octane Number, $(RON+MON)/2$, of the blend.~~

~~5. A method according to claim 3 which comprises:~~

~~blending the BOB according to the initial BOB blend recipe,~~

~~measuring the Research Octane Number (RON) of the BOB,~~

measuring the Motor Octane Number (MON) of the BOB,

determining the octane sensitivity (RON-MON) of the BOB,

blending the BOB to an octane number determined by the octane sensitivity (RON-MON) of the BOB such that upon blending with the pre-determined proportion of alcohol, the Anti-Knock Index/Pump Octane Number, $(RON+MON)/2$, of the alcohol /BOB blend conforms to the pre-determined octane specification.

6. A method according to anyone of the preceding claims in which the blending of the BOB with the alcohol is carried out at a location remote from the location where the BOB is blended.

7. A method according to anyone of the preceding claims in which the BOB is blended to an initial BOB blend recipe to meet the required octane specification after the addition of the alcohol, with the BOB octane requirement determined according to the octane sensitivity (RON-MON) of the BOB and the proportion of alcohol which is to be added to the BOB to form the oxygenated blend.

8. A method according to anyone of the preceding claims in which the BOB is blended such that its required $(R+M)/2$ octane number is decreased by up to 0.2 numbers per 1 number decrease in the octane sensitivity of the BOB.

9. A method according to anyone of the preceding claims in which the alcohol is ethanol.

10. A method according to claim 9 in which the BOB is blended with ethanol to formulate a blended product comprising 10 vol percent ethanol.

11. A method according to claim 10 in which the BOB is blended with ethanol to formulate a blended product comprising 15 vol percent ethanol.

12. A method of controlling and optimizing the manufacture of a petroleum refinery gasoline pool comprising (i) a first grade which is a non-oxygenated gasoline grade blended to conform to a first blend requirement and (ii) a second grade which is a hydrocarbon Blendstock for Oxygenate Blending (BOB) blended to conform to a second blend requirement lower than the first such that when the BOB is blended with the required amount of alcohol it meets the octane requirement for the BOB/alcohol blend, which method comprises:

~~blending refinery gasoline streams of varying octane number for the two grades~~
with the first grade receiving a higher proportion of blend components with higher octane sensitivity than the second grade.

13. A method according to claim 12 in which hydrocarbon BOB is blended to an optimized BOB blend recipe which is (i) formulated to provide a BOB octane (RON, MON, and/or $(R+M)/2$) which will meet the octane specification required for the BOB-alcohol blend when the BOB is blended with the alcohol, and (ii) based on the effect of BOB sensitivity (RON-MON) on the octane boost resulting from the addition of the alcohol to the BOB.

14. A method according to claim 13 in which the BOB is blended to an initial BOB blend recipe to meet the required octane specification after the addition of the alcohol, with the BOB octane requirement determined according to the octane sensitivity (RON-MON) of the BOB and the proportion of alcohol oxygenate which is to be added to the BOB to form the oxygenated blend.

15. A method according to anyone of claims 12-14 in which the blend components with higher octane sensitivity include olefins and/or aromatics.

16. A method according to anyone of claims 12-14 in which the second grade comprises a blend including iso-paraffins.

CLAIMS:

1. A method for manufacturing a hydrocarbon Basestock for Oxygenate Blending (BOB) to be blended with an alcohol to a required BOB-alcohol blend octane specification, which comprises:

determining an octane sensitivity (Research Octane Number (RON)-Motor Octane Number (MON)) of a BOB;

determining a relationship between the octane of the BOB and a required octane number of a BOB-alcohol blend, wherein said relationship is based upon the effect of BOB sensitivity on the octane boost resulting from the addition of alcohol to the BOB;

formulating a blend recipe for a BOB, wherein the blend recipe is formulated to provide a BOB octane (RON, MON, and/or $(R+M)/2$) which will meet required octane specification(s) of a BOB-alcohol blend, and wherein the blend recipe is based upon the relationship between the octane of the BOB and the required octane number of the BOB-alcohol blend; and

blending the BOB in accordance with the blend recipe.

2. The method of claim 1 further comprising blending the BOB with an alcohol to form a BOB-alcohol blend conforming to required octane specification(s).

3. The method of claim 2 wherein the blending of the BOB with the alcohol is carried out at a location remote from the location where the BOB is blended.

4. The method of claim 1 wherein the relationship between the octane of the BOB and the octane number of a BOB-alcohol blend is based upon the effect of BOB sensitivity on the octane boost resulting from the addition of alcohol to the BOB and the proportion of alcohol to be added to the BOB.

5. The method of claim 1 wherein the relationship between the octane of the BOB and the octane number of a BOB-alcohol blend is such that the BOB-alcohol

blend octane number is decreased by up to 0.2 numbers per 1 number decrease in the octane sensitivity of the BOB.

6. The method of claim 2 wherein the alcohol is ethanol.

7. The method of claim 6 wherein the BOB is blended with ethanol to formulate a blended product comprising 10 volume percent ethanol.

8. The method of claim 7 wherein the BOB is blended with ethanol to formulate a blended product comprising 15 vol percent ethanol.

9. The method of claim 1 wherein the required octane specification of the BOB-alcohol blend is the Anti-Knock Index/Pump Octane Number, $(RON+MON)/2$, of the blend.

10. A method of controlling the manufacture of a petroleum refinery gasoline pool comprising (i) a first grade which is a non-oxygenated gasoline grade blended to conform to a first blend octane requirement and (ii) a second grade which is a hydrocarbon Blendstock for Oxygenate Blending (BOB) blended to conform to a second blend octane requirement lower than the first grade such that when the BOB is blended with a required amount of alcohol it meets an octane requirement for a BOB-alcohol blend, which method comprises:

blending refinery gasoline streams of varying octane number for the first and second grades with the first grade receiving a higher proportion of blend components with higher octane sensitivity than the second grade.

11. A method according to claim 10 wherein the second grade is formulated according to the following steps:

determining an octane sensitivity (Research Octane Number (RON)-Motor Octane Number (MON)) of a BOB;

determining a relationship between the octane of the BOB and a required octane number of a BOB-alcohol blend, wherein said relationship is based upon the

effect of BOB sensitivity on the octane boost resulting from the addition of alcohol to the BOB;

formulating a blend recipe for a BOB, wherein the blend recipe is formulated to provide a BOB octane (RON MON and/or $(R+M)/2$ which will meet required octane specification(s) of a BOB-alcohol blend, and wherein the blend recipe is based upon the relationship between octane of the BOB and the required octane number of the BOB-alcohol blend; and

blending the BOB in accordance with the blend recipe.

12. A method according to claim 10 in which the blend components with higher octane sensitivity include olefins and/or aromatics.

13. A method according to claim 11 in which the second grade comprises a blend including iso-paraffins.