

CLAIMS

1. A process for making a high VI lubricating base oil, comprising:
 - a) hydrocracking a blend, comprising (1) a heavy wax derived from pyrolyzing a plastic feed and (2) a lube oil feedstock, in a lube hydrocracking zone in the presence of a hydrocracking catalyst and hydrogen under lube hydrocracking conditions to produce a hydrocracked stream; and
 - b) dewaxing at least a portion of the hydrocracked stream in a hydroisomerization zone in the presence of a hydroisomerization catalyst and hydrogen under hydroisomerization conditions to produce a base oil.
2. The process of claim 1, wherein the blend comprises from 10 to 90 wt. % of the heavy wax and from 90 to 10 wt. % of the lube oil feedstock, based on the total weight of the blend.
3. The process of claim 1, wherein less than 5 wt. % of the heavy wax boils above 1000°F (538°C).
4. The process of claim 1, wherein the heavy wax comprises at least 30 wt. % n-paraffins.
5. The process of claim 1, wherein the heavy wax comprises at least 5 wt. % 1-olefins.
6. The process of claim 1, wherein the heavy wax comprises less than 3 wt. % aromatics.
7. The process of claim 1, wherein the heavy wax comprises less than 1 wt. % oxygenates.
8. The process of claim 1, wherein the plastic feed comprises at least 80 wt. % polyethylene.
9. The process of claim 8, wherein the polyethylene is selected from the group consisting of waste polyethylene, virgin polyethylene, and mixtures thereof.

10. The process of claim 8, wherein the polyethylene is selected from the group consisting of high-density polyethylene, low-density polyethylene, and mixtures thereof.
11. The process of claim 1, wherein the lube oil feedstock is a vacuum gas oil.
12. The process of claim 1, wherein the base oil has a kinematic viscosity at 100°C of from 3 to 7 mm²/s.
13. The process of claim 1, wherein the base oil is a Group II+ base oil.
14. The process of claim 1, wherein the base oil is a Group III base oil.
15. The process of claim 1, further comprising stabilizing the base oil in a hydrofinishing zone in the presence of a hydrofinishing catalyst and hydrogen under hydrofinishing conditions.

CLAIMS

1. A process for making a high VI lubricating base oil, comprising:
 - a) hydrocracking a blend, comprising (1) a heavy wax derived from pyrolyzing a plastic feed and (2) a lube oil feedstock, in a lube hydrocracking zone in the presence of a hydrocracking catalyst and hydrogen under lube hydrocracking conditions to produce a hydrocracked stream; and
 - b) dewaxing at least a portion of the hydrocracked stream in a hydroisomerization zone in the presence of a hydroisomerization catalyst and hydrogen under hydroisomerization conditions to produce a base oil,
wherein the heavy wax comprises at least 30 wt. % n-paraffins, and wherein the heavy wax is a lubricating oil boiling range material (650°F+, 343°C+ boiling range).
2. The process of claim 1, wherein the blend comprises from 10 to 90 wt. % of the heavy wax and from 90 to 10 wt. % of the lube oil feedstock, based on the total weight of the blend.
3. The process of claim 1, wherein less than 5 wt. % of the heavy wax boils above 1000°F (538°C).
4. The process of claim 1, wherein the heavy wax comprises at least 5 wt. % 1-olefins.
5. The process of claim 1, wherein the heavy wax comprises less than 3 wt. % aromatics.
6. The process of claim 1, wherein the heavy wax comprises less than 1 wt. % oxygenates.

7. The process of claim 1, wherein the plastic feed comprises at least 80 wt. % polyethylene.
8. The process of claim 7, wherein the polyethylene is selected from the group consisting of waste polyethylene, virgin polyethylene, and mixtures thereof.
9. The process of claim 7, wherein the polyethylene is selected from the group consisting of high-density polyethylene, low-density polyethylene, and mixtures thereof.
10. The process of claim 1, wherein the lube oil feedstock is a vacuum gas oil.
11. The process of claim 1, wherein the base oil has a kinematic viscosity at 100°C of from 3 to 7 mm²/s.
12. The process of claim 1, wherein the base oil is a Group II+ base oil.
13. The process of claim 1, wherein the base oil is a Group III base oil.
14. The process of claim 1, further comprising stabilizing the base oil in a hydrofinishing zone in the presence of a hydrofinishing catalyst and hydrogen under hydrofinishing conditions.