EXTRACTED CONJUNCT POLYMER NAPHTHA

This application relates to co-filed applications titled, "ALKYLATION PROCESS WITH RECYLE OF HYDROGEN AND RECOVERY OF HYDROGEN CHLORIDE", and "HYDROGEN RECYCLE AND HYDROGEN CHLORIDE RECOVERY IN AN ALKYLATION PROCESS", herein incorporated in their entireties.

TECHNICAL FIELD

This application is directed to compositions of extracted conjunct polymer naphtha and blended alkylate gasoline; and processes for their production.

BACKGROUND

High-quality alkylate gasolines are needed for spark-ignited automotive engines. It is desired that new or more efficient processes be developed to produce these gasolines, and that these gasolines have improved qualities.

SUMMARY

This application provides an extracted conjunct polymer naphtha (45), comprising a hydrogenated conjunct polymer, from a used ionic liquid catalyst, having a final boiling point less than 246°C (475°F), a Bromine Number of 5 or less, and at least 30 wt% naphthenes.

This application provides an extracted conjunct polymer naphtha (45), comprising a hydrogenated conjunct polymer, from a used ionic liquid catalyst, and having a final boiling point less than 246°C (475°F), a boiling point range distribution from 90°F to 474°F (32°C to 245°C), a Bromine Number of 5 or less, and at least 30 wt% naphthenes.

This application provides a blended alkylate gasoline (97), comprising an extracted conjunct polymer naphtha (45) and alkylate products (80), wherein the extracted conjunct polymer naphtha (45) has a final boiling point less than 246°C (475°F), a Bromine Number of 5 or less, and at least 30 wt% naphthenes.

This application provides a blended alkylate gasoline (97), comprising an extracted conjunct polymer naphtha (45) and alkylate products (80), wherein the extracted conjunct polymer naphtha (45) has a final boiling point less than 246°C (475°F), a boiling point range distribution from 90°F to 474°F (32°C to 245°C), a Bromine Number of 5 or less, and at least 30 wt% naphthenes.

This application provides an extracted conjunct polymer naphtha (45), made by a process comprising:

a. regenerating a used ionic liquid catalyst comprising a conjunct polymer in a hydrogenation reactor (100) to make a regenerated catalyst effluent (10);

b. mixing the regenerated catalyst effluent (10) or a separated liquid from the regenerated catalyst effluent (10) with a conjunct polymer extraction solvent (55); and

c. separating out the conjunct polymer extraction solvent (55) to produce the extracted conjunct polymer naphtha (45); wherein the extracted conjunct polymer naphtha

(45) has a final boiling point less than 246°C (475°F), a Bromine Number of 5 or less, and at least 30 wt% naphthenes.

This application provides an extracted conjunct polymer naphtha (45), made by a process comprising:

a. regenerating a used ionic liquid catalyst comprising a conjunct polymer in a hydrogenation reactor (100) to make a regenerated catalyst effluent (10);

b. mixing the regenerated catalyst effluent (10) or a separated liquid from the regenerated catalyst effluent (10) with a conjunct polymer extraction solvent (55); and

c. separating out the conjunct polymer extraction solvent (55) to produce the extracted conjunct polymer naphtha (45); wherein the extracted conjunct polymer naphtha (45) has a final boiling point less than 246°C (475°F), a boiling point range distribution from 90°F to 474°F (32°C to 245°C), a Bromine Number of 5 or less, and at least 30 wt% naphthenes.

This application also provides a blended alkylate gasoline (97), made by a process comprising:

a. regenerating a used ionic liquid catalyst comprising a conjunct polymer in a hydrogenation reactor (100) to make a regenerated catalyst effluent (10);

b. mixing the regenerated catalyst effluent (10) or a separated liquid from the regenerated catalyst effluent (10) with an effluent from an alkylation reactor (40); and

c. separating out an ionic liquid catalyst stream (60) from the mixture made in step b) to produce the blended alkylate gasoline (97) comprising greater than 50 wppm methylcyclohexane.

This application provides a blended alkylate gasoline (97), made by a process comprising:

a. regenerating a used ionic liquid catalyst comprising a conjunct polymer in a hydrogenation reactor (100) to make a regenerated catalyst effluent (10);

b. mixing the regenerated catalyst effluent (10) or a separated liquid from the regenerated catalyst effluent (10) with an effluent from an alkylation reactor (40), without an extraction step to remove an extracted conjunct polymer naphtha (45) from the regenerated catalyst effluent (10) prior to the mixing, to make a mixture; and

c. separating out an ionic liquid catalyst stream (60) from the mixture made in step b) to produce the blended alkylate gasoline (97) comprising greater than 50 wppm methylcyclohexane.

This application also provides an integrated alkylation process, comprising:

a. regenerating a used ionic liquid catalyst comprising a conjunct polymer in a hydrogenation reactor (100) to make a regenerated catalyst effluent (10);

b. mixing the regenerated catalyst effluent (10) or a separated liquid from the regenerated catalyst effluent (10) with an effluent from an alkylation reactor (40); and

c. separating out an ionic liquid catalyst stream (60) from the mixture made in step b) to produce a blended alkylate gasoline (97) comprising greater than 50 wppm methylcyclohexane.

This application also provides a method to analyze alkylate products, comprising: determining an amount of methylcyclohexane in alkylate products (80) and based on the amount, estimating a quantity of extracted conjunct polymer naphtha (45) in the alkylate products (80).

This application provides a method to analyze alkylate products, comprising: determining an amount of methylcyclohexane in the alkylate products (80) and based on the amount of methylcyclohexane, estimating a quantity of extracted conjunct polymer naphtha (45) in the alkylate products (80); wherein the extracted conjunct polymer naphtha has a boiling point range distribution from 90°F to 474°F (32°C to 245°C).

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a diagram of an integrated alkylation process, demonstrating direct blending of extracted conjunct polymer naphtha with alkylate products.

FIGURE 2 is a diagram of an integrated alkylation process to produce extracted conjunct polymer naphtha.

DETAILED DESCRIPTION

Referring to Figure 1, isoparaffin feed (65) and olefin feed (75) are fed to an alkylation reactor (300). The effluent from an alkylation reactor (40) is blended with regenerated catalyst effluent (10) and fed to an ionic liquid catalyst and hydrocarbon