REPLACEMENT SHEETS OF AMENDED CLAIMS

WHAT IS CLAIMED IS:

1. A method for reducing halide concentration in a hydrocarbon product having an organic halide content from 50 to 4000 ppm which is made by a hydrocarbon conversion process using an ionic liquid catalyst comprising a halogen-containing acidic ionic liquid comprising contacting at least a portion of the hydrocarbon product with at least one molecular sieve having pore size from 4 to 16 Angstrom under organic halide absorption conditions to reduce the halogen concentration in the hydrocarbon product to less than 40 ppm

2. The method according to claim 1, claim 17, or claim 18, wherein the hydrocarbon conversion process is selected from the group consisting of alkylation, polymerization, dimerization, oligomerization, acetylation, metatheses, copolymerization, isomerization, olefin hydrogenation, hydroformylation and combinations thereof.

3. The method according to claim 1, claim 17, or claim 18, wherein the catalyst further comprises a Bronsted acid co-catalyst.

4. The method according to claim 1, claim 17, or claim 18, wherein the molecular sieve is selected from the group consisting of large pore size

zeolites, intermediate pore size zeolites, small pore size zeolites and their mixtures.

5. The method according to claim 1, claim 17, or claim 18, wherein the molecular sieve is selected from the group consisting of Zeolite X, Zeolite Y, USY zeolite, Mordenite, ALPO-5, SAPO-5, Beta, ZSM-12, MCM-22, MCM-36, MCM-68, ITQ-7, ITQ-10, ITQ-14, SSZ-24, SSZ-31, SSZ-33, SSZ-48, SSZ-55, SSZ-59, SSZ-60 and their mixtures.

6. The method according to claim 1, claim 17, or claim 18, wherein the molecular sieve is selected from the group consisting of ZSM-5, ZSM-11, ZSM-22, ZSM-35, ALPO-11, SAPO-11, SSZ-25, SSZ-32, SSZ-35, SSZ-41, SSZ-44 and their mixtures.

7. The method according to claim 1, claim 17, or claim 18, wherein the molecular sieve is selected from the group consisting of Zeolite A, SSZ-16, SSZ-39, SSZ-52 and their mixtures.

8. The method according to claim 1, claim 17, or claim 18, wherein the molecular sieve is reactivated and reused as the at least one molecular sieve.

9. An alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 6 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 3 to 6 carbon atoms with a halogen-containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate with at least one molecular sieve having a pore size from 4 to 16 Angstrom under organic halide absorption conditions to produce an alkylate hydrocarbon product with an organic chloride content less than 40 ppm.

10. The alkylation process according to claim 9, claim 19, or claim 20, wherein the molecular sieve is selected from the group consisting of large pore size zeolites, intermediate pore size zeolites, small pore size zeolites and their mixtures.

11. The alkylation process according to claim 9, claim 19, or claim 20, wherein the molecular sieve is selected from the group consisting of Zeolite X, Zeolite Y, USY zeolite, Mordenite, ALPO-5, SAPO-5, Beta, ZSM-12, MCM-22, MCM-36, MCM-68, ITQ-7, ITQ-10, ITQ-14, SSZ-24, SSZ-31, SSZ-33, SSZ-48, SSZ-55, SSZ-59, SSZ-60 and their mixtures.

12. The alkylation process according to claim 9, claim 19, or claim 20, wherein the molecular sieve is selected from the group consisting of ZSM-5, ZSM-11, ZSM-22, ZSM-35, ALPO-11, SAPO-11, SSZ-25, SSZ-32, SSZ-35, SSZ-41, SSZ-44 and their mixtures.

13. The alkylation process according to claim 9, claim 19, or claim 20, wherein the molecular sieve is selected from the group consisting of Zeolite A, SSZ-16, SSZ-39, SSZ-52 and their mixtures.

14. The alkylation process according to claim 9, claim 19, or claim 20, wherein the ionic liquid catalyst used is N-butylpyridinium chloroaluminate.

15. The alkylation process according to claim 9, claim 19, or claim 20, wherein the molecular sieve is reactivated and reused as the at least one molecular sieve.

16. The alkylation process according to claim 15, wherein the molecular sieve is reactivated by heating to a temperature from 200 to 1000 deg F under a flow of desorption medium.

17. The method according to claim 1, whereby the organic halide is absorbed during the contacting.

18. The method according to claim 1, wherein the hydrocarbon product comprises an alkylate gasoline.

19. The alkylation process according to claim 9, whereby the organic halide is absorbed during the contacting of the at least the portion of the alkylate with at least one molecular sieve.

20. The alkylation process according to claim 9, wherein the alkylate hydrocarbon product comprises a gasoline.

WHAT IS CLAIMED IS:

1. An alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 6 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 4 to 6 carbon atoms with a halogen-containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate gasoline having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate gasoline with at least one molecular sieve having a pore size from 4 to 16 Angstrom under organic halide absorption conditions, whereby the organic halide is absorbed during the contacting to reduce the organic halide content by 97.1% or greater in the alkylate gasoline to an amount less than 40 ppm.

2. The alkylation process according to claim 1, wherein the molecular sieve is selected from the group consisting of large pore size zeolites, intermediate pore size zeolites, small pore size zeolites and their mixtures.

3. The alkylation process according to claim 1, wherein the molecular sieve is selected from the group consisting of Zeolite X, Zeolite Y, USY zeolite, Mordenite, ALPO-5, SAPO-5, Beta, ZSM-12, MCM-22, MCM-36, MCM-68, ITQ-7, ITQ-10, ITQ-14, SSZ-24, SSZ-31, SSZ-33, SSZ-48, SSZ-55, SSZ-59, SSZ-60 and their mixtures.

4. The alkylation process according to claim 1, wherein the molecular sieve is selected from the group consisting of ZSM-5, ZSM-11, ZSM-22, ZSM-35, ALPO-11, SAPO-11, SSZ-25, SSZ-32, SSZ-35, SSZ-41, SSZ-44 and their mixtures.

5. The alkylation process according to claim 1, wherein the molecular sieve is selected from the group consisting of Zeolite A, SSZ-16, SSZ-39, SSZ-52 and their mixtures.

6. The alkylation process according to claim 1, wherein the ionic liquid catalyst used is N-butylpyridinium chloroaluminate.

7. The alkylation process according to claim 1, wherein the molecular sieve is reactivated and reused as the at least one molecular sieve.

8. The alkylation process according to claim 1, wherein the molecular sieve is NaX zeolite.

9. An alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 5 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 4 to 6 carbon atoms with a halogen-containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate with at least one molecular sieve having a pore size from 4 to 16 Angstrom under organic halide absorption conditions to reduce the organic halide content in the alkylate by 97.1% or greater to produce an alkylate hydrocarbon product with an organic chloride content less than 40 ppm; whereby the organic halide is absorbed during the contacting of the at least the portion of the alkylate with at least one molecular sieve and the alkylate hydrocarbon product is not degraded during the contacting.

10. The alkylation process according to claim 9, wherein the molecular sieve is selected from the group consisting of large pore size zeolites, intermediate pore size zeolites, small pore size zeolites and their mixtures.

11. The alkylation process according to claim 9, wherein the ionic liquid catalyst used is N-butylpyridinium chloroaluminate.

12. The alkylation process according to claim 9, wherein the molecular sieve is reactivated and reused as the at least one molecular sieve.

13. The alkylation process according to claim 9, wherein the alkylate hydrocarbon product comprises an alkylate gasoline.

14. The alkylation process of claim 9, wherein the at least one molecular sieve comprises a mixture of a large pore size zeolite and a small pore size zeolite.

15. The alkylation process of claim 9, wherein the at least one molecular sieve comprises a mixture of different small pore zeolites.

16. An alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 6 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 4 to 6 carbon atoms with a halogen-containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate with at least one molecular sieve under organic halide absorption conditions to reduce the organic halide content by 97.1% or greater to produce an alkylate gasoline with an organic chloride content less than 40 ppm; and wherein the alkylate gasoline is not degraded during the contacting of the at least the portion of the alkylate with the at least one molecular sieve.

17. The alkylation process according to claim 1, wherein the at least one olefin has from 2 to 5 carbon atoms and the at least one isoparaffin has 4 carbon atoms.

18. The alkylation process according to claim 9, wherein the at least one isoparaffin has 4 carbon atoms.

19. The alkylation process according to claim 16, wherein the at least one olefin has from 2 to 5 carbon atoms and the at least one isoparaffin has 4 carbon atoms.

20. The alkylation process according to claim 1, wherein, as analyzed by gas chromatography, the contacting causes no degradation of the alkylate gasoline.

21. The alkylation process according to claim 9, wherein, as analyzed by gas chromatography, the alkylate hydrocarbon product is not degraded.

22. The alkylation process according to claim 16, wherein, as analyzed by gas chromatography, the alkylate gasoline is not degraded.

23. The alkylation process according to claim 1, wherein the organic halide content of the alkylate prior to contacting is from 880 to 4000 ppm.

24. The alkylation process according to claim 9, wherein the organic halide content of the alkylate prior to contacting is from 880 to 4000 ppm.

25. The alkylation process according to claim 16, wherein the organic halide content of the alkylate prior to contacting is from 880 to 4000 ppm.

26. The alkylation process according to claim 9, wherein the contacting of the at least the portion of the alkylate produces the alkylate hydrocarbon product with the organic chloride content less than 10 ppm.

27. The alkylation process according to claim 1, wherein the contacting causes no degradation of the alkylate gasoline.

28. The alkylation process according to claim 1, wherein the organic halide absorption conditions include passing the at least the portion of the alkylate gasoline over the at least one molecular sieve at a linear hourly space velocity between 1 hr and 10 hr.

29. The alkylation process according to claim 9, wherein the organic halide absorption conditions include passing the at least the portion of the alkylate over the at least one molecular sieve at a linear hourly space velocity between 1 hr^{-} and 10 hr^{-}.

30. The alkylation process according to claim 16, wherein the organic halide absorption conditions include passing the at least the portion of the alkylate over the at least one molecular sieve at a linear hourly space velocity between 1 hr^{-} and 10 hr^{-}.