CLAIMS

What is claimed is:

1. A 1-butene production process comprising:

introducing a C_4 containing stream into a paraffin removal process to form an olefin rich stream, wherein the paraffin removal process comprises the step:

(a) extractive distillation utilizing a solvent comprising an organonitrile; and

(b) optionally, passing the C_4 containing stream over a semi-permeable membrane; and

wherein the solvent is diluted with water prior to extractive distillation with an amount of water sufficient to provide a solvent mixture comprising from 1 wt.% to 15 wt.% water; and

isomerizing at least a portion of the 2-butene present in the olefin rich stream to 1-butene to form an isomerization product stream comprising at least 80 wt.% 1-butene

wherein the isomerizing at least a portion of the 2-butene present in the olefin rich stream to 1-butene occurs in the presence of an isomerization catalyst comprising a potassium promoted alpha aluminum catalyst.

2. The process of claim 1, wherein the C4 containing stream comprises raffinate-1.
3. The process of claim 1, wherein the C4 containing stream comprises isobutylene, 1-butene, 2-butene, n-butane and isobutane.
4. The process of claim 1, wherein the C4 containing stream comprises paraffins and olefins.
5. The process of claim 1, wherein the C4 containing stream comprises from 20 wt.% to 70 wt.% olefins and from 30 wt.% to 80 wt.% paraffins.
6. The process of claim 1, wherein the solvent comprises acetonitrile.
7. The process of claim 1, wherein the solvent is diluted with water prior to extractive distillation with an amount of water sufficient to provide a solvent mixture comprising from 2 wt.% to 10 wt.% water.
8. The process of claim 1, wherein the paraffin removal process comprises passing the C4 containing stream over a semi-permeable membrane comprising 30-60 wt. % metal

selected from silver, copper and combinations thereof and a polysaccharide membrane chelated with the metal.

9. The process of claim 1, wherein the olefin rich stream comprises less than 5 wt.% paraffins.

10. The process of claim 1 further comprising separating 1-butene present in the olefin rich stream prior to isomerizing.

11. The process of claim 1, wherein the isomerization product stream comprises at least 95 wt.% 1-butene.

12. The process of claim 1, wherein the isomerizing at least a portion of the 2-butene present in the olefin rich stream to 1-butene occurs at isomerization conditions comprising a temperature of at least 350 °C, a WHSV of at least 10 hr^{-1}, and a pressure of from 75 psig to 125 psig.

13. The process of claim 1 further comprising separating isobutylene present in the olefin rich stream prior to isomerizing.

14. The process of claim 13, wherein the separating isobutylene comprises contacting the olefin rich stream with methanol in the presence of an ion-exchange catalyst.

15. A process for the removal of paraffins:

providing a C_4 containing stream comprising isobutylene, 1-butene, 2-butene, n-butane and isobutane:

introducing the C_4 containing stream into a paraffin removal process to form an olefin rich stream, wherein the paraffin removal process comprises the step of extractive distillation utilizing a solvent comprising an organonitrile, wherein the solvent is diluted with water prior to extractive distillation with an amount of water sufficient to provide a solvent mixture comprising from 1 wt.% to 15 wt.% water; and recovering the olefin rich stream from the paraffin removal process, wherein the olefin rich stream comprises less than 5 wt.% paraffins

wherein the olefin rich stream is introduced into an isomerization process, and the isomerization process comprises isomerizing at least a portion of the 2-butene present in the olefin rich stream to 1-butene in the presence of an isomerization catalyst comprising a potassium promoted alpha aluminum catalyst.

16. The process of claim 15, wherein the olefin rich stream is introduced into a alkylation process, an olefin conversion process, an isomerization process, an MTBE production process or combinations thereof.

17. The process of claim 15, wherein the isomerizing at least a portion of the 2-butene present in the olefin rich stream to 1-butene occurs at isomerization conditions comprising a temperature of at least 350 °C, a WHSV of at least 10 hr^{-1}, and a pressure of from 75 psig to 125 psig.

18. The process of claim 15, comprising the step of passing the C4 containing stream over a semi-permeable membrane.