The invention claimed is:

1. A process for preparing oligomers by continuous oligomerization of butenes, comprising

a) reacting a feed stream 1) comprising 1-butene and 2-butene in a total concentration of from 10 to 70% by weight and from 20 to 60% by weight of isobutane until more than 60% by weight of the 1-butene comprised in the feed stream 1 but less than 50% by weight of the 2-butene comprised in feed stream 1 have been con- verted into oligomers,

b) separating off the oligomers obtained in a) and option- ally passing to a further work-up and the remaining residual stream is fed to work-up by distillation,

c) separating off the isobutane by distillation from the remaining residual stream,

d) reacting an isobutane-depleted stream obtained after the work-up by distillation c) (hereinafter referred to as feed stream 2) to form oligomers

wherein feed stream 1) and feed stream 2) are different.

2. The process according to claim 1, wherein the feed stream 1) comprises 1 butene and 2-butene in a total concentration of from 30 to 60% by weight.

3. The process according to claim 2, wherein feed stream 1 comprises from 5 to 30% by weight of 1-butene and from 20 to 40% by weight of2-butene.

4. The process according to claim 1, wherein feed stream 1 comprises from 30 to 50% by weight

of isobutane.

5. The process according to claim 1, wherein the feed stream 1 is reacted in a) until more

than 80% by weight of the 1-butene comprised in feed stream 1 but less than 50% by weight of the

2-butene are converted into oligomers.

6. The process according to claim 1, wherein the total amount of the remaining residual

stream is from 5 to 95% by weight of feed stream 1.

7. The process according to claim 1, wherein the remaining residual stream consists of

from 30 to 40% by weight of 2-butene

from 1 to 10% by weight of 1-butene

from 40 to 55% by weight of isobutane

from 10 to 20% by weight of n-butane

from 0 to 5% by weight of other constituents.

8. The process according to claim 1, wherein process step

c) is not an extractive distillation.

9. The process according to claim 1, wherein more than 80% by weight of the isobutane are separated off from the remaining residual stream in process step c).

10. The process according to claim 1, wherein the feed stream 2 obtained after process step c)

consists of

from 60 to 70% by weight of2-butene

from 0to 5% by weight of 1-butene

from 1 to 10% by weight of isobutane

from 20 to 40% by weight of n-butane

from 0 to 2% by weight of other constituents.

11. The process according to claim 1, wherein the oligomers from the oligomerizations a) and d) are passed to a joint work-up.

12. The process according to claim 1, wherein the total 1- and 2-butene comprised in feed stream 1

are converted to an extent of more than 90% by weight into oligomers.

13. The process according to claim 1, wherein the total oligomers obtained are a mixture of

from 70 to 100% by weight of octene

from 0 to 30% by weight of dodecene

from 0 to 20% by weight of higher oligomers.

14. The process according to claim 1, wherein the remaining residual stream consists of

from 10 to 60% by weight of 2-butene

from 1 to 30% by weight of 1-butene

from 20 to 70% by weight of isobutane

from 1 to 40% by weight of n-butane

from 0 to 10% by weight of other constituents.