Claims

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

   a) a feed stream comprising 1-butene and 2-butene in a total concentration of from 10 to 70% by weight and from 10 to 60% by weight of isobutane is used (hereinafter referred to as feed stream 1),

   b) this feed stream 1 is reacted 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 converted into oligomers,

   c) the oligomers obtained in b) are separated off and optionally passed to a further work-up and the remaining residual stream is fed to work-up by distillation,

   d) isobutane is separated off by distillation from the residual stream,

   e) the isobutane-depleted stream obtained after the work-up by distillation d) (hereinafter referred to as feed stream 2) is reacted to form oligomers.

2. The process according to claim 1, wherein the feed stream 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 of 2-butene.

4. The process according to any of claims 1 to 3, wherein feed stream 1 comprises from 30 to 50% by weight of isobutane.

5. The process according to any of claims 1 to 4, wherein the feed stream 1 is reacted in process step b) 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 any of claims 1 to 5, wherein the total amount of the residual stream is from 5 to 95% by weight of feed stream 1.

7. The process according to any of claims 1 to 6, wherein the 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 any of claims 1 to 7, wherein process step d) is not an extractive distillation.

9. The process according to any of claims 1 to 8, wherein more than 80% by weight of the isobutane are separated off from the residual stream in process step d).

10. The process according to any of claims 1 to 9, wherein the feed stream 2 obtained after process step d) consists of

from 60 to 70% by weight of 2-butene
from 0 to 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 any of claims 1 to 10, wherein the oligomers from the oligomerizations b) and e) are passed to a joint work-up.

12. The process according to any of claims 1 to 11, 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 any of claims 1 to 12, 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.

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b) this feed stream 1 is reacted 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 converted into oligomers,

c) the oligomers obtained in b) are separated off and optionally passed to a further work-up and the remaining residual stream is fed to work-up by distillation,

d) isobutane is separated off by distillation from the residual stream,

e) the isobutane-depleted stream obtained after the work-up by distillation d) (hereinafter referred to as feed stream 2) is reacted to form oligomers, 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.