Claims

1. Process for treating an effluent obtained from a dimerization step, comprising a step of neutralizing said effluent to deactivate a catalytic composition followed by a step of thermal separation of the neutralized effluent, comprising:

- a first vaporization step performed at a pressure of between 2.0 and 5.0 MPa and at a temperature of between 90 and 130°C, to obtain a liquid fraction sent to a second vaporization step, and a gas fraction, preferably sent to a distillation section,

- said second vaporization step is performed at a pressure of between 0.5 and 3.0 MPa and at a temperature of between 90 and 130°C, to obtain a liquid fraction sent to a third vaporization step and a gas fraction; preferably, said gas fraction is sent to the distillation section,

- said third vaporization step is performed at a pressure of between 0.1 and 1.5 MPa and at a temperature of between 80 and 130°C, making it possible to obtain a liquid fraction and a gas fraction; preferably, said gas fraction is sent to the distillation section

- in which the pressure of the first vaporization step is higher than the pressure of the second vaporization step, preferably by at least 0.5 MPa, preferably by at least 1.0 MPa, preferably by at least 1.5 MPa, and the pressure of the second vaporization step is higher than the pressure of the third vaporization step, preferably by at least 0.5 MPa, preferably by at least 0.8 MPa.

2. Process according to Claim 1, in which the first vaporization step is performed at a pressure of between 2.0 MPa and 4.5 MPa, preferably between 2.5 MPa and 4.0 MPa.

3. Process according to any one of the preceding claims, in which the second vaporization step is performed at a pressure of between 0.8 MPa and 3.0 MPa, preferably between 1.0 MPa and 2.0 MPa.

4. Process according to the preceding claim, in which the third vaporization step is performed at a pressure of between 0.3 MPa and 1.2 MPa, preferably between 0.4 MPa and 1.0 MPa.

5. Process according to any one of the preceding claims, in which the first step and/or the second step and/or the third step of thermal separation are performed by means of a flash vessel, preferably coupled with a heat exchanger.

6. Process according to any one of the preceding claims, in which the gas fraction obtained from the first vaporization step and/or the gas fraction obtained from the second vaporization step and/or the gas fraction obtained from the third vaporization step are liquefied by reducing the temperature, so as to reach a pressure of between 2.0 and 5.0 MPa and preferably to be sent to the distillation section.

7. Process according to Claim 6, in which the temperature for liquefying the gas fraction(s) obtained from the vaporization steps is between 0 and 60°C.

8. Process according to any one of the preceding claims, in which the oligomerization step uses a catalytic composition comprising an alkylaluminium halide and optionally a nickel precursor.

9. Process according to Claim 8, in which the alkylaluminium halide corresponds to the formula $[Al_mR^5_nX_{3-n}]_o$ in which

- R^5 is a linear or branched alkyl group, containing from 1 to 12 carbon atoms,

- X is a chlorine or bromine atom, and preferably a chlorine atom, and

- m is chosen from 1 and 2,

- n is chosen from 0, 1 and 2,

- o is chosen from 1 and 2.

10. Process according to either of Claims 8 and 9, in which the effluent obtained from an oligomerization step has a content of alkylaluminium halide of between 0.01 and 100 000 ppm by weight.

11. Process according to any one of the preceding claims, in which the step of neutralization of the effluent obtained from the oligomerization step is performed by placing said effluent in contact with a neutralizing system comprising:

- an alcohol of general formula R^1OH, in which the group R^1 is chosen from:

* a linear or branched alkyl group containing from 2 to 20 carbon atoms,

* an aryl group containing from 5 to 30 carbon atoms, and/or

- an amine of general formula $NR^2R^3R^4$, in which the groups R^2, R^3 and R^4, which may be identical or different, are chosen independently from:

* a hydrogen,

* a linear or branched alkyl group containing from 1 to 20 carbon atoms and optionally substituted with an NH_2 group.

12. Process according to Claim 11, in which the temperature at which the neutralizing system is placed in contact with the effluent obtained from the oligomerization step is that at which said oligomerization step takes place.

13. Process according to either of Claims 11 and 12, in which the neutralizing system comprises an alcohol of general formula R^1OH and an amine of general formula $NR^2R^3R^4$.

14. Process according to Claim 13, in which the mole ratio of the amine to the alcohol is between 0.5 and 100.