CLAIMS

1. A process for the at least partial condensation of an oxygenate mixture, the process comprising the steps of:
   (a) providing a vapour phase oxygenate mixture obtained from fragmentation of an aqueous solution of carbohydrates;
   (b) performing on the vapour phase oxygenate mixture an at least partial condensation to provide a condensate; and
   (c) combining an antifoaming agent and the condensate.

2. A process according to claim 1 wherein the vapour phase oxygenate mixture is derived from biomass.

3. A process according to claim 1 or 2 wherein the vapour phase oxygenate mixture comprises C1-C3 oxygenates.

4. A process according to any one of claims 1-3 wherein the carbohydrates of the aqueous solution of carbohydrates are selected from monosaccharides, disaccharides, or mixtures thereof.

5. A process according to any one of claims 1-4 wherein the carbohydrates of the aqueous solution of carbohydrates comprise at least 40 wt.% of monosaccharides based on the total amount of carbohydrates.

6. A process according to any one of claims 1-5 wherein the antifoaming agent comprises one or more active ingredients independently selected from an alcohol, an ether, a carboxylic acid, an ester, a silicone, a silica, an oil, a wax, and an acrylate.

7. A process according to claims 6, wherein the antifoaming agent has a total active ingredient content of from 0.0000001 wt.% to 100 wt.%, based on the total weight of the antifoaming agent.

8. A process according to any one of claims 1-7 wherein the combining the antifoaming agent and the condensate comprises adding the antifoaming agent to the condensate.

9. A process according to claim 8 wherein the antifoaming agent is added to the condensate at a rate of from 0.0000001 mL/hour to 200 mL/hour.

10. A process according to any one of claims 1-9 wherein the the fragmentation of the aqueous solution of carbohydrates to provide the vapour phase oxygenate mixture comprises adding the aqueous solution of carbohydrates to a fragmentation reactor and subjecting the aqueous solution of carbohydrates to thermolytic fragmentation.

11. A process according to any one of claims 1-10 wherein the mass ratio of the antifoaming agent to the condensate in the combined antifoaming agent and condensate is from 1:1000000 to 1:1.

12. A process according to any one of claims 1-11 wherein in step (b) the vapour phase oxygenate mixture is at least partially condensed at a temperature of from 0 to 150 °C.

13. A process according to any one of claims 1-12 wherein the performing on the vapour phase oxygenate mixture an at least partial condensation comprises: feeding an input stream comprising the vapour phase oxygenate mixture through a condenser to provide the condensate and an output stream.

14. A process according to claim 13 wherein the performing on the vapour phase oxygenate mixture an at least partial condensation comprises:
recycling at least part of the output stream into the input stream.

15. A process according to claim 13 or 14 wherein the performing on the vapour phase oxygenate mixture an at least partial condensation comprises: splitting the condensate into at least a condensate product stream and a condensate recycle stream, and adding the condensate recycle stream to the condenser.

16. A process according to claim 15 wherein the combining the antifoaming agent and the condensate comprises adding the antifoaming agent to the condensate recycle stream to form a mixture and adding the mixture to the condenser.

17. A process according to any one of claims 1-16 wherein step (b) is performed on an oxygenate mixture obtained directly from fragmentation of an aqueous solution of carbohydrates.

18. A system configured to at least partially condense an oxygenate mixture, the system comprising:
(a) a fragmentation reactor configured to fragment an aqueous solution of carbohydrates to provide a vapour phase oxygenate mixture;
(b) a condenser configured to at least partially condense the vapour phase oxygenate mixture to provide a condensate; and
(c) a unit configured to combine an antifoaming agent and the condensate.

19. A system according to claim 18 wherein the fragmentation reactor is a selected from: a thermolytic fragmentation reactor; and a fluidised bed reactor such as a bubbling bed reactor, a turbulent bed reactor, or a riser-type reactor.

20. A system according to claim 18 or 19 wherein the fragmentation reactor comprises: a feed inlet; and a product outlet; a riser; and a fluidisation gas inlet.

21. A system according to any one of claims 18-20 comprising:
a separator configured to separate particulate matter from the vapour phase oxygenate mixture.