CLAIMS

1. A process for the production of dialkyl succinate from a feedstock comprising succinic acid produced by fermentation processes comprising the steps of:
   (a) feeding solid succinic acid produced by fermentation processes to a first reactor where it is contacted with alkanol, said first reactor being operated at a suitable temperature and pressure to enable autocatalytic esterification to occur;
   (b) passing a stream removed from the first reactor comprising unreacted succinic acid, mono alkyl ester, dialkyl ester, alkanol, water and impurities to a point at or near the top of a reaction zone columm operated at temperatures and pressures to enable esterification of the succinic acid and further esterification of the mono alkyl ester, and passing said stream in counter-current reaction to upflowing additional alkanol;
   (c) removing a stream from at or near the bottom of the reaction zone column comprising components selected from residual succinic acid, mono alkyl ester, dialkyl ester, impurities and alkanol and passing said stream to a bottoms stream separation zone where said di-alkyl ester is separated from alkanol, and from the succinic acid, mono alkyl ester and impurities;
   (d) recycling the succinic acid and mono alkyl ester to the reaction zone column;
   (e) removing at least some of the impurities as a purge; and
   (f) removing a stream comprising alkanol, water and organic components from at or near the top of the reaction zone column and passing said stream to a top stream distillation zone where the alkanol is separated, from the water and from the organic components and recycling the organic components to the reaction zone column.

2. A process according to Claim 1 wherein said first reactor is a stirred tank reactor.

3. A process according to Claim 2, wherein the stirred tank reactor is operated at a temperature in the region of from 120°C to 140°C.

4. A process according to Claim 2 or 3 wherein the pressure within the stirred tank reactor is in the region of from 5 bara to 10 bara.

5. A process according to any one of Claims 1 to 4 wherein the stream from the first reactor comprising unreacted succinic acid, mono alkyl ester, dialkyl ester, alkanol, water and impurities is passed via a subsequent reaction vessel.

6. A process according to Claim 5 wherein the subsequent reaction vessel is a plug flow reaction vessel.

7. A process according to any one of Claims 1 to 6 wherein the stream is passed through a distillation column before being fed to the reaction zone column.

8. A process according to any one of Claims 1 to 7 wherein the reaction zone column is operated at an overhead pressure of 1.3 bara to 10 bara.

9. A process according to any one of Claims 1 to 8 wherein the reaction zone column is operated at a temperature of 100°C to 300°C.

10. A process according to any one of Claims 1 to 9 wherein an alkanol wash is applied at or near the top of the reaction zone column.

11. A process according to any one of Claims 1 to 10 wherein the bottoms stream separation zone is a hydrogen stripping zone.

12. A process according to any one of Claims 1 to 10 wherein the bottoms stream separation zone is a bottom stream distillation zone

13. A process according to Claim 12 wherein the bottoms stream separation zone is operated at an overhead pressure of from 0.1 bara to 1 bara.

14. A process according to Claim 12 or 13 wherein the dialkyl succinate is removed as a liquid side draw.

15. A process according to Claim 14 wherein the liquid side draw is removed from a point above the feed point to the bottoms stream distillation zone.

16. A process according to any one of Claims 1 to 15 wherein the recovered alkanol from the bottoms stream separation zone is recycled to one or both of the first reactor and the reaction zone column.

17. A process according to any one of Claims 1 to 16 wherein the residual succinic acid and any mono-ester are recycled to the reaction zone column.

18. A process according to Claim 17 wherein the recycled residual succinic acid any mono-ester are recycled to the reaction zone column at a point below the point at which the feed from the first reactor is added.

19. A process according to any one of Claims 1 to 18 wherein the impurities are removed as a purge from the bottoms stream separation zone.

20. A process according to any one of Claims 1 to 19 wherein the overhead from the reaction column zone comprising alkanol, water and organic components is passed to a condenser before being passed to a top stream distillation column.

21. A process according to any one of Claims 1 to 20 wherein the top stream distillation column is operated at an overhead pressure of 1.3 bara to 2 bara.

22. A process according to any one of Claims 1 to 21 wherein a liquid side draw is taken from the top stream distillation column.

23. A process according to Claim 22 wherein the side draw is passed to a separator to separate an aqueous phase form an organic phase.

24. A process according to Claim 23 wherein the organic phase is recycled to the reaction zone column.

25. A process according to Claim 23 or 24 wherein the aqueous phase is returned to the top stream distillation column.

26. A process according to Claim 25 wherein the aqueous phase is returned to the column at a point below the draw point for the liquid side draw.

27. A process according to any one of Claims 1 to 26 wherein the esterification in the reaction zone column and one or both of the distillation zones can be located in separate columns.

28. A process according to any one of Claims 1 to 27 wherein the alkanol is methanol.