As originally filed

What is claimed is:

1. An integrated process for preparing trioxane from formaldehyde, which comprises the following steps:

   a) a stream A1 comprising water and formaldehyde and a recycle stream B2 consisting substantially of water and formaldehyde are fed to a trioxane synthesis reactor in which the formaldehyde is converted to trioxane to obtain a product stream A2 comprising trioxane, water and formaldehyde;

   b) stream A2 is fed to a first distillation column and distilled at a pressure in the range from 0.1 to 2.5 bar to obtain a stream B1 enriched in trioxane, and the stream B2 consisting substantially of water and formaldehyde;

   c) stream B1 and a recycle stream D1 comprising trioxane, water and formaldehyde are fed to a second distillation column and distilled at a pressure in the range from 0.2 to 17.5 bar to obtain a product stream C2 consisting substantially of trioxane, and a stream C1 comprising trioxane, water and formaldehyde;

   d) stream C1 is fed to a third distillation column and distilled at a pressure in the range from 0.1 to 2.5 bar to obtain the recycle stream D1 comprising trioxane, water and formaldehyde, and a stream D2 consisting substantially of water and formaldehyde.

2. The process according to claim 1, wherein the distillations b) and d) are carried out at a pressure in the range from 0.4 to 1.5 bar and the distillation c) at a pressure in the range from 2 to 7 bar.

3. The process according to claim 1 or 2, wherein stream B1 is withdrawn as a top draw stream and stream B2 as a bottom draw stream from the first distillation column.

4. The process according to any of claims 1 to 3, wherein stream B1 is fed as a first side feed and stream D1 as a second side feed to the second distillation column then fed stream C1 is withdrawn as a top draw stream and stream C2 as a bottom draw stream.

5. The process according to any of claims 1 to 3, wherein stream B1 and stream D1 are mixed and then fed as a side feed to the second distillation column.

6. The process according to any of claims 1 to 5, wherein stream C1 is fed as a side feed to the third distillation column, stream D1 is withdrawn as a top draw stream and stream D2 as a bottom draw stream.

7. The process according to any of claims 1 to 6, which additionally comprises the following steps:

   e) a feed stream F1 comprising water and formaldehyde is fed to a formaldehyde concentration unit, stream A1 is withdrawn from the concentration unit as a formaldehyde-rich bottom draw stream and a low-formaldehyde stream F2 is withdrawn as a top or vapor draw stream;

   f) stream D2 and stream F2 are fed to a fourth distillation column and distilled at a pressure in the range from 1 to 10 bar to obtain a stream E1 comprising water and formaldehyde and a stream E2 consisting substantially of water.

8. The process according to claim 7, wherein stream D2 is fed as a first side feed and stream F2 as a second side feed to the fourth distillation column, stream E1 is withdrawn as a top draw stream and stream E2 consisting substantially of water as a bottom draw stream.

9. The process according to claim 7, wherein stream D2 and stream F2 are mixed and then fed as a side feed to the fourth distillation column.

10. The process according to any of claims 7 to 9, wherein the distillation f) is carried out at a pressure in the range from 2 to 5 bar.

11. The process according to any of claims 7 to 10, wherein the formaldehyde concentration unit is a distillation column.

12. The process according to any of claims 7 to 10, wherein the formaldehyde concentration unit is an evaporator.

13. The process according to claim 12, wherein the formaldehyde concentration unit is a falling-film evaporator.

14. The process according to any of claims 7 to 13, wherein stream E1 is fed to the formaldehyde concentration unit.

15. The process according to any of claims 7 to 13, wherein stream E1 is fed to the trioxane synthesis reactor.