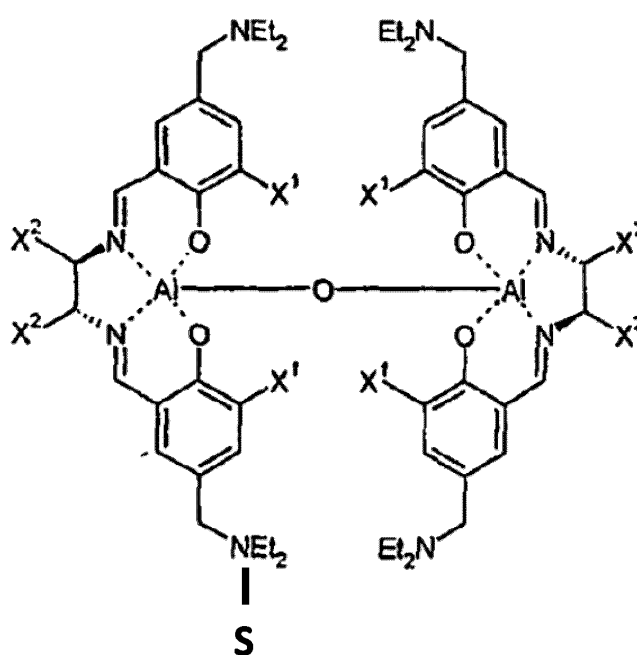


CLAIMS

1. Process to continuously prepare a cyclic carbonate product by reacting an epoxide compound with carbon dioxide in the presence of a heterogeneous catalyst which catalyst is activated by an activating compound,
5 wherein the process is performed in at least a first, second, third reactor, each reactor comprising a slurry of the heterogeneous catalyst and the cyclic carbonate product as present as a liquid,
wherein to the first reactor carbon dioxide and the epoxide compound is continuously supplied, liquid cyclic carbonate is discharged as a first product stream and unreacted carbon dioxide and epoxide are discharged as a first gaseous effluent stream while
10 substantially all of the heterogeneous catalyst remains in the first reactor and wherein the heterogeneous catalyst deactivates in time,
wherein to the second reactor the first gaseous effluent is continuously supplied,
15 liquid cyclic carbonate is discharged as a second product stream and unreacted carbon dioxide and epoxide is discharged as a second gaseous effluent stream while substantially all of the heterogeneous catalyst remains in the second reactor,
wherein to the third reactor the activating compound is added to activate the heterogeneous catalyst thereby obtaining a reactor comprising activated
20 heterogeneous catalyst and
wherein in a next step of the process the third reactor becomes the second reactor, the second reactor becomes the first reactor and the first reactor becomes the third reactor such to activate the deactivated catalyst present in said reactor.
- 25 2. Process according to claim 1, wherein the temperature in the first and second reactor is between 20 and 150 °C and the absolute pressure is between 0.1 and 0.5 MPa and wherein temperature is below the boiling temperature of the cyclic carbonate product at the chosen pressure.
- 30 3. Process according to any one of claims 1-2, wherein the heterogeneous catalyst comprises an organic compound containing one or more nucleophilic groups.

4. Process according to claim 3, wherein the nucleophilic group is a quaternary nitrogen halide.
5. Process according to claim 4, wherein the heterogeneous catalyst is a supported dimeric aluminium salen complex and the activating compound is a halide compound.
6. Process according to claim 5, wherein the supported dimeric aluminium salen complex is represented by the following formula:



wherein S represents a solid support connected to the nitrogen atom via an alkylene group, wherein the supported dimeric aluminium salen complex is activated by a halide compound and wherein X^1 is tertiary butyl and X^2 is hydrogen and wherein Et is an alkyl group having 1 to 10 carbon atoms.

7. Process according to claim 6, wherein the support S is composed of particles having an average diameter of between 10 and 2000 μm .

8. Process according to claim 7, wherein the support S is a particle chosen from the group consisting of silica, alumina, titania, siliceous MCM-41 or siliceous MCM-48.
9. Process according to any one of claims 5-8, wherein the halide compound is benzyl halide.
10. Process according to claim 9, wherein the benzyl halide is benzyl bromide.
11. Process according to any one of claims 1-10, wherein the time period of one step is between 1-30 days.
12. Process according to any one of claims 1-11, wherein the first product stream and the second product stream are combined in a combined stream and wherein epoxide present in the combined product stream is stripped out by contacting the combined product stream with carbon dioxide resulting in a cleaned product stream and a loaded carbon dioxide stream containing epoxide compound and wherein the loaded carbon dioxide stream is supplied to the first reactor.
13. Process according to claim 12, wherein the cyclic carbonate product as present in cleaned product stream is separated from the activating compound as present in the combined product stream in a distillation step wherein a purified cyclic carbonate product is obtained as a bottom product of the distillation step.
14. Process according to claim 13, wherein the activating compound obtained in the distillation step is used to activate the deactivated catalyst in the third reactor.
15. Process according to any one of claims 13-14, wherein the first product stream and the second product stream and/or the combined stream pass a buffer vessel upstream of the distillation step.
16. Process according to claim 15, wherein the heterogeneous catalyst is a supported dimeric aluminium salen complex and the activating compound is a halide compound.

and wherein the volume of the buffer vessel or vessels expressed in m^3 relative to the amount of dimeric aluminium salen complex as present in the first and second reactor and expressed in kmol is between 5 and 50 m^3/kmol .

- 5 17. Process according to any one of claims 1-16, wherein part of the second gaseous effluent is recycled to the first reactor and part of the second gaseous effluent is purged from the process.
18. Process according to any one of claims 1-17, wherein the epoxide compound has 2 to
10 8 carbon atoms.
19. Process according to claim 18, wherein the epoxide compound is ethylene oxide, propylene oxide, butylene oxide, pentene oxide, glycidol or styrene oxide.