

TECHNOLOGY OFFER: CO-PRODUCTION OF CARBONATES AND FATTY NITRILES/AMINES

OVERVIEW

Description: Process , Pilot , Product , R&D knowledge , Other .

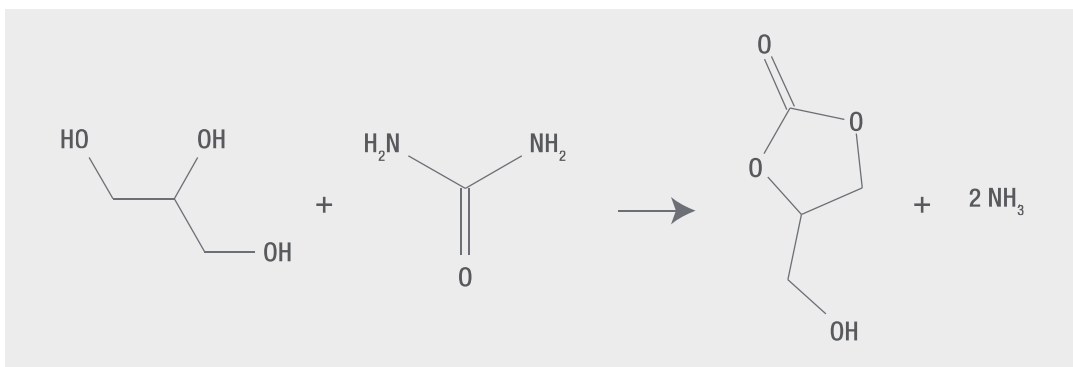
Benefit summary: Carbonates are produced by reacting alcohols or polyols and urea, thereby releasing ammonia, which is recovered to react with fatty acids to produce salts, amides, nitriles and amines.

Development summary: Tested at lab scale (2 kg fatty nitrile scale)

IP Summary: The technology is supported by 10 European Patents and 1 US, CN, JP, ZA Patent.

Novelty

- **Technology Benefit description:** Since ammonia is more and more difficult to transport and to store, due to new regulations, there is a strong advantage to provide a solution for on-site production of ammonia from urea which is easy to store and transport. In the present case, the principle of atom economy is used since the carbonate (from urea) is transferred to make an organic carbonate of high value. When glycerol carbonate is the target, then both raw materials (Glycerol and fatty acids) can be available on the same site.
- **Technology differentiation versus competition (and Uniqueness):** Several companies have patented processes to make carbonates, but these processes either use another organic carbonate such as DMC or DEC and alcoholysis, or use toxic phosgene, or use urea but ammonia is lost or used to make ammonium sulphate.



Development

- **Technology Readiness Level (Scale):** TRL 1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; 9
- **Development Status summary:** Ammonia recovery has been tested by Arkema, enabling this combined process

Instrument: Large Scale Collaborative Project
Thematic Priority: FP7-ENERGY.2009.3.3.1

Grant Agreement: 241718

Intellectual Property

Patent Application / Granted				
Priority Patent Number	Title	Countries	Status	Priority date
FR 07.55236	Coproduction of cyclic carbonates and fatty nitriles/amines	BE, CN, DE, ES, FR, ID, JP, NL, SE, ZA*	Granted	24/05/2007
FR 07.55185	Coproduction of non cyclic carbonates and fatty nitriles/amines	DE, ES, FR, NL	Granted	22/05/2007

* Patents have been filed in other countries.

Patents were listed as accessible Background to EuroBioRef by ARKEMA.

Note that other Technology Offer can be added to a package, such as an improvement of the Carbonate synthesis.

See also the Technology offer on Trimethylcarbonate.

Provider

- **Technology provided by:** ARKEMA FRANCE
- **Related Expertise:**

Partner	Academic/Industry	Research / Pilot / Demonstration / Other
ARKEMA	INDUSTRY	Arkema is a producer of fatty nitriles/amines through its subsidiary CECA

Technical Details

- **Long description:** The technology package covers the synthesis of carbonate through reaction of urea and alcohols or polyols and recovery of the ammonia released for on-site utilisation for synthesis of fatty nitriles, or salts/amides. The technology is particularly suitable to avoid storage and transportation of dangerous ammonia (ammonia users), and for disposing of ammonia for the organic carbonates producers (carbonate producers). The technology would be suitable for an association of producers.

Licensing

- **Collaboration type sought:** Collaboration for technology development, Licensing, Transfer of IP.
- **Support provided:** Documentation, Personnel, Pilot. Arkema is a producer of fatty nitriles/amines through its subsidiary CECA and would consider any possible collaboration. Production of an organic Carbonate on Arkema/CECA's Industrial site would be considered favourably.

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