

TECHNOLOGY OFFER: PROCESS FOR BIOBASED ACRYLONITRILE

OVERVIEW

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

Benefit summary: New route to produce acrylonitrile from glycerol with a direct or indirect process through acrolein as a non-isolated intermediate.

Development summary: laboratory scale for acrylonitrile.

IP Summary: The technology is supported by 3 granted Patents, in the field of glycerol conversion to acrylonitrile, and many granted patents in the field of glycerol dehydration to acrolein.

Novelty

- **Technology Benefit description:** Glycerol dehydration to acrolein in a first step, then acrolein ammoxidation in a second continuous step, with partial condensation of heavies and water interstage.
- **Technology differentiation versus competition (and Uniqueness):** Conventional technology is a direct ammoxidation of propylene (fossil based). The new route offers a renewable alternative for acrylonitrile.

Development

- **Technology Readiness Level (Scale):** TRL 1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; 9
- **Development Status summary:** TRL of 3 to 4 for the acrylonitrile production, but TRL of 7 to 8 for acrolein production by glycerol dehydration. Arkema operated a pilot plant and developed a catalyst for Glycerol Dehydration to acrolein.

Intellectual Property

Patent Application / Granted				
Priority Patent Number	Title	Countries	Status	Priority date
FR07.53293	Process for synthesis of Acrylonitrile from Glycerol	FR, RU, SG*	Granted	16/02/2007

* Patents have been filed in other countries, where patents are pending. Provider

Provider

- **Technology provided by:** ARKEMA France.
- **Related Expertise:** Arkema has been developing a process for glycerol dehydration to acrolein, but also of glycerol oxydehydration to acrylic acid. These technologies are supported by several dozens of patent applications and granted patents. The expertise developed in these fields is in a large part transferred to Acrylonitrile synthesis

Partner	Academic/Industry	Research / Pilot / Demonstration / Other
ARKEMA	Industry	Research Level for glycerol to acrylonitrile. But Pilot/demonstration status for glycerol conversion to acrolein and Acrylic acid (scale of several kg/day achieved)

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

Grant Agreement: 241718

Technical Details

- **Long description:** The glycerol dehydration to acrolein is the key step of Arkema's technology to produce acrylic acid from glycerol. This reaction has been piloted at several kg/day scale. Glycerol dehydration to Acrolein can be licensed when used in combination of acrolein ammoxidation to acrylonitrile.

Licensing

- **Collaboration type sought:** Licensing, Transfer of IP. This technology transfer would come with license of other Arkema patents in the field of glycerol dehydration to acrolein as long as the final product is not aiming at Acrylic Acid. Arkema is not an acrylonitrile producer, so all the technology related to acrylonitrile can be transferred.
- **Support provided:** Documentation, Catalysts for glycerol dehydration developed jointly with a catalysts manufacturer.

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