

## TECHNOLOGY OFFER: BIOBASED MALEIC ANHYDRIDE-PHTHALIC ANHYDRIDE

### OVERVIEW

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

**Benefit summary:** Oxidation of n-butanol gives Maleic anhydride with eventually coproduction of some Phthalic anhydride.

**Development summary:** Process was studied within EuroBioRef.

**IP Summary:** The technology is supported by 2 granted Patents in Europe and 1 US Patent.

### Novelty

- **Technology Benefit description:** In EuroBioRef the option to retrofit an existing Phthalic Anhydride plant to make Maleic Anhydride has been studied. It was shown that with a new catalyst, and minimum investment the plant could produce maleic anhydride. Combination with Phthalic Anhydride production is also possible.
- **Technology differentiation versus competition (and Uniqueness):** Biobased Maleic Anhydride and Phthalic Anhydride can be produced.

### Development

- **Technology Readiness Level (Scale):** TRL 1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; 9
- **Development Status summary:** the reaction has been tested at lab scale by CIRCC and piloted by ORGACHIM during the EuroBioRef project. ARKEMA prepared a catalyst at several kg scale, and PDC worked on the process design.

### Intellectual Property

Patent Application / Granted				
Priority Patent Number	Title	Countries	Status	Priority date
FR 08.54896	Process for synthesis of a carboxylic acid anhydride	BA, FR, US*	Granted	18/07/2008

\* Patents have been filed in other countries.

This patent has been listed as Accessible Background by Arkema.

### Provider

- **Technology provided by:** ARKEMA FRANCE (for the patent listed above), CIRCC, PDC, Ruse Chemicals
- **Related Expertise:**

Partner	Academic/Industry	Research / Pilot / Demonstration / Other
ARKEMA	INDUSTRY	Research – Owner of patent application and granted patents Producer of Phthalic Anhydride (plant in Chauny, France to be shutdown)

#### Other Owners of Related Technology in case of shared Foreground

CIRCC	ACADEMIC	Research,
PDC	INDUSTRY	Process Design
Ruse Chemicals	INDUSTRY	Research, Producer of Phthalic Anhydride (plant in Ruse, Bulgaria), operated the pilot plant



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

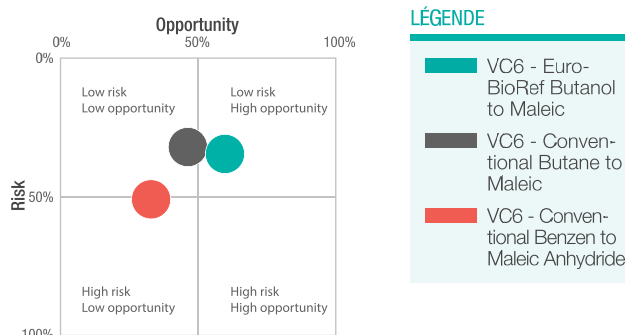
**Grant Agreement:** 241718

## Technical Details

- **Long description:** n-butanol oxidation with a dedicated catalyst can be used to produce Maleic Anhydride. The retrofit of an existing Phthalic Anhydride was considered as a valuable option since the reaction coproduce some phthalic anhydride and since current o-Xylene oxidation plants produce Maleic anhydride as a coproduct of phthalic anhydride.

The technology was assessed using the IPscore software questionnaire versus the conventional routes by butane or benzene oxidation to maleic anhydride/

### Diagnostic report on risk and potential factors



## Licensing

- **Collaboration type sought:** Collaboration for technology development, Licensing, Transfer of IP (according to partners concerned).
- **Support provided:** Documentation, Personnel, Pilot (depending on the partners).

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