



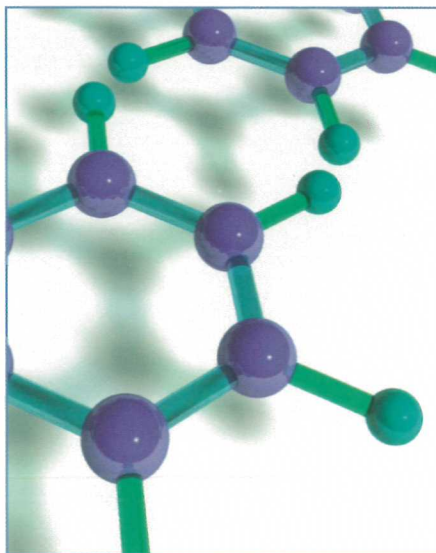
Chemicals and Services

ISOICHEM offers

**Custom Chemical
Synthesis**



**Fine chemicals
and building blocks**



**Research
and Development**



"THE KEY SOLUTION PROVIDER"



Custom Synthesis based on a wide range of technical competencies

Reaction process

Reaction volume of 450 m³

Reactor size from 100 L to 25,000 L (glass lined and stainless steel)

Reaction temperature from -70°C to 250°C

Pressure reaction : hydrogenation up to 40 bar and 150°C (Biazzi reactor)

Liquid process

Distillation : batch and film units, including for corrosive product, vacuum down to 1 mbar and temperature up to 200°C

Solid process

Crystallization: Reactors from 100 L to 25,000 L

Filtration: Closed and stirred plate filter (up to 1.5 T per batch including for corrosive chemicals), automatic Larox press filter, centrifuge filtration

Drying: Stirred dryer (up to 1.5 T per batch), tray dryers, vacuum dryers, sieving and packaging

Chemistry

Chemistry and reactions highlights:

- Phosgene chemistry
- Phosphorus trichloride chemistry
- Hydrazine and downstream heterocyclic chemistry

- Organometallic chemistry including organo-lithium reagents (BuLi, LDA, ...)
- Chlorination (POCl₃, PCl₃, SOCl₂, SO₂Cl₂,...)
- Reductions with boron and aluminium hydrides, in situ generated diborane (B₂H₆)
- Catalytic hydrogenation up to 40 bar
- Polymerization
- Lewis catalyst chemistry (BCl₃, TiCl₄, BF₃, AlCl₃,...)
- Amino acid N-Carboxyanhydride synthesis and polymerization (NCA, UNCA)
- Many other classical reactions

Quality, Safety and Environment:

ISOICHEM is certified ISO9001-2008

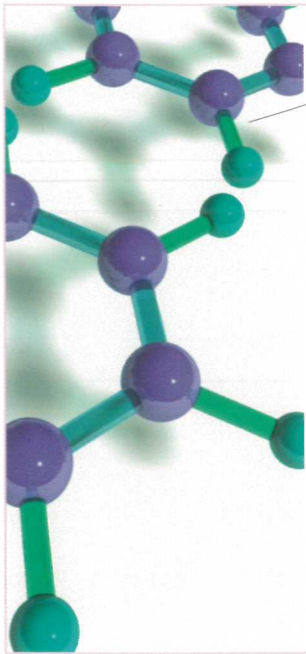
ISOICHEM ensures an excellent level of safety for its products and processes.

ISOICHEM is engaged in the Responsible Care® program striving to systematically reduce the impact of chemicals on water, air and soil. ISOICHEM has an integrated recycling or disposal management of its wastes.





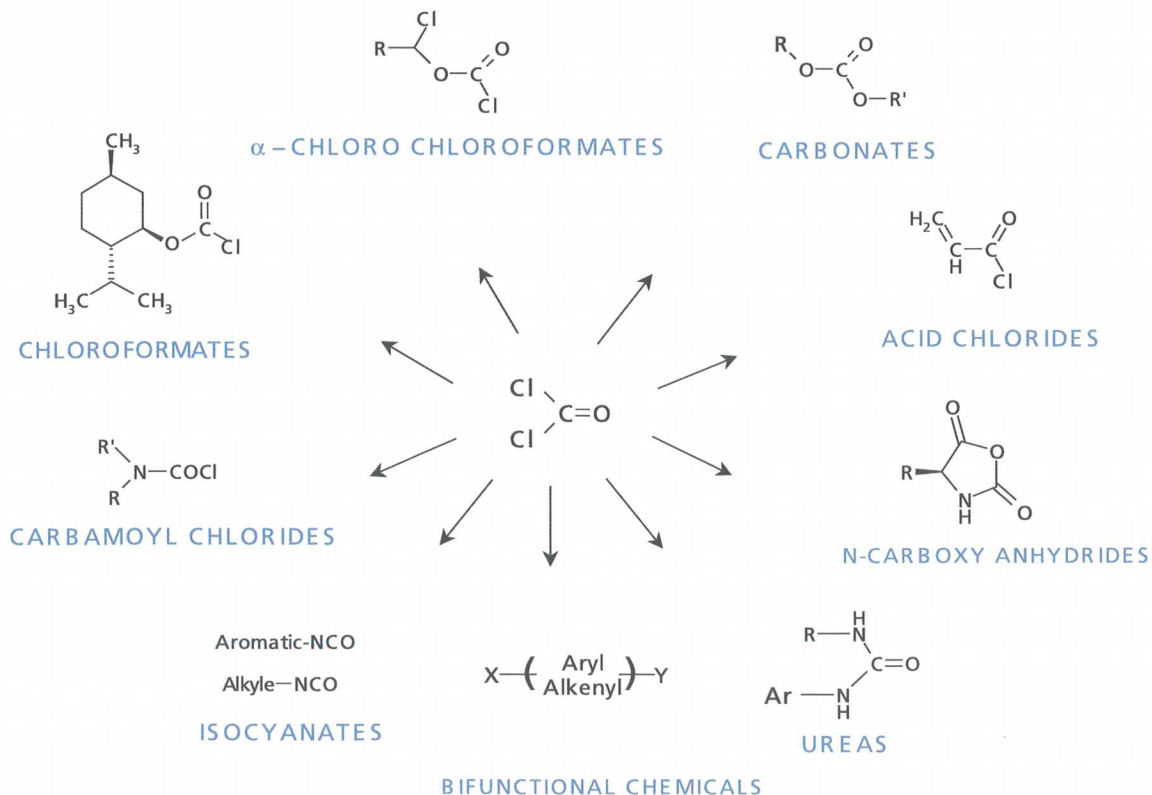
Fine chemicals and building blocks streaming from a technology platform



- Acid chlorides
- Chloroformates
- Chlorochloroformates
- Carbonates
- Carbamoyl chlorides
- Isocyanates
- N-Carboxyanhydrides (NCA)
- Ureas
- Bifunctional chemicals
- Alcohols
- Alkyl chlorides
- Ethers
- Ketones
- Carboxylic Acids
- Esters
- Heteroaromatic compounds
- Hydrazines
- Nitro compounds
- Amines
- Amino acid derivatives
- Phosphorus derivatives (PCl₃)
- Others chemicals based on our technologies and know-how



Phosgene derivatives





Research and Development of new chemicals for your innovation

R&D teams

About 25 employees offer an innovative and customer oriented workforce including strong chemical, process, analytical knowledge expertise and process safety and risk management.

Typical services cover new multifunctional chemical preparation, including chemical feasibility, lab sample preparation for R&D purpose, rapid scale-up from pilot unit to larger scale production.

R&D facilities

From gram scale up to hundred of grams experiments.

- Automatic lab reaction unit and multireactor unit
- Calorimetric facilities for process and chemicals safety evaluation (RC1, DSC)
- Phosgene and of toxic chemicals handling
- Pressure reaction (hydrogenation)
- Liquid and solid separation, purification and handling
- On site analytical equipments (HPLC, GC, GC/MS/MS, GPC, KF, IR, UV,...)
- Access to additional product analysis via subcontractors (NMR, ICP-MS,...)

From Kilograms to hundreds of Kilogram

- Flexible pilot unit (Chemical reaction, distillation, solid processing,...)

Expertise network

- Academic and private laboratories network for expertise (crystal structure, physical properties,...)

Collaboration activities

- With customer R&D and innovation activities
- With academic laboratories
- In collaborative innovation programs



- A global service provider network

GLOBAL PRODUCT MANAGER:

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