Organic Fluorinated Intermediates
Compounds For Your Sophisticated Needs
Organic Fluorinated Intermediates

With Organic Intermediates, Solvay responds to a rapidly expanding market with diverse needs for new compounds mainly in the Pharma and Agrochemicals sectors.

The use of organic fluorinated intermediates has grown to become a key component for many blockbusters in the industrial domain and for society as a whole. Solvay’s product range covers well known CF₃-derivatives like Trifluoroacetylchloride, Trifluoroacetic acid and Triflic acid and its derivatives as well as downstream products like 4-Ethoxy-1,1,1-trifluor-3-buten-2-on, some fluorinated Pyrazoles, Pyrimidiones and Pyridones and fluorinated Ionic liquids.

Using our long-term knowledge, experience and capabilities in fluorine chemistry we provide you with excellent products based on efficient production processes. Innovation together with a strong commitment to service are our blueprint.

Markets & Applications

Agrochemicals

The rapidly growing world population means that highly efficient plant protection products have become crucial. More than 50% of agrochemicals recently developed contain fluorine because of its efficiency increasing attributes for fungicides, herbicides and insecticides.

Solvay offers top-quality products using innovative, cost-effective production lines to meet the business challenges which the agrochemical industry faces.

In addition to the commercialized aliphatic fluorinated products we already provide at large scale, we will develop new molecules to meet your specific needs.

Pharmaceuticals

A growing number of blockbuster drugs contain fluorine atoms because they increase bioactivity of the API. Fluorine can be found in different medicinal treatments such as:

- Analgesics
- Anesthetics
- Antibiotics
- Anticancer agents
- Antifungals
- Antiviral drugs
- Anti-HIV treatments

Electronic and Coating Additives

Our aliphatic fluorinated building blocks can be used for a variety of applications such as electronic conducting materials, photovoltaics but also coating materials for flat panel displays, touch screens and fingerprint scanners.

Ionic Liquids are of interest in particular for applications in battery technologies i.e. lithium air or lithium sulphur and for application in optoelectronics like dye sensitized solar cells.
**Products**

We offer a broad range of aliphatic fluorinated special-
ties such as CF$_3$ and CF$_2$ molecules. One of our latest
innovations is ETFBO. This product is a good exam-
ple of a highly reactive molecule that we now produce at commercial scale. A set of production lines and a
dedicated team with long experience in fluorine chem-
istry enable us to respond flexibly to your changing needs. Our agrochemical and pharmaceutical cus-
tomers in particular benefit from this flexibility, as they often produce active ingredients in batches only once or twice a year.

Starting from TFAC and other compounds of our existing product range, we can often synthesise and scale up the molecule meeting your particular needs. We are your partner!
## Product Overview

<table>
<thead>
<tr>
<th>Category</th>
<th>Chemical Name</th>
<th>Abbrev</th>
<th>CAS Number</th>
<th>Commercially Available</th>
<th>In Development</th>
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Together with you we make a range of fluorinated specialities available, please contact us: emea.fluorides@solvay.com
ETFBO – 4-Ethoxy-1,1,1-trifluoro-3-buten-2-one
- Permeate plant cells easier reducing dosage
- Pre-determine breaking point in the molecule at which soil organisms can attack
- Assure molecule decomposition not affecting the environment
- Multiple reactivity centers for versatile syntheses
- Substance
- \( \text{F}_3\text{C} - \text{C}(\text{O}) - \text{CH} = \text{CH} - \text{OEt}_2 \)
- Purity: min. 98.0%

TFAC – Trifluoroacetyl chloride
- Stable and highly reactive
- Can be used as a gas or in liquid form
- Substance
- \( \text{CF}_3\text{COCl} \)
- Purity: min. 99.5%

Super Acid for Catalysis Needs

TA – TRIFLIC ACID
- Triflic acid belongs to the class of superacids, it’s the strongest Brønsted acid available at industrial scale
- Triflic acid is used:
  - as an acidic catalyst in many reactions in organic synthesis and in cationic polymerization
  - for electronic applications like liquid crystals and batteries
  - as synthesis intermediates for chemical applications
- High efficiency
- Good leaving group in organic synthesis
- Due to its unique properties the triflate anion is also an excellent anion for ionic liquids
- Triflic acid and anion are extremely stable towards oxidation, reduction and heat
- Safe and environmentally friendly
Developing New Molecules

We have extensive experience in developing and manufacturing aliphatic fluorinated compounds and derivatives. Developing new molecules based on TFAC and other compounds of our product range, is one of our key strengths.

ETFBO – The Versatile Building Block for the Chemistry of the Future

Our development process aims at achieving the ideal synthesis route and production process: efficient and cost-effective. The service comprises the delivery of a first sample as well as trials at our pilot plant. We relieve you from REACH registration and ensure flexible and safe delivery. We help you speed up your development and to save valuable time to market.
Capabilities, Services & Technologies

Capabilities and Services
Capabilities and Services Solvay has been among the market leaders in fluorne chemistry for many years. Our worldwide R&D team possesses deep expertise in developing new fluorinated building blocks and intermediates. Our service covers all steps of the development process. Starting with the development of new molecules and first sample preparation through to the full set of necessary HSE and REACH registration, we are your partner.

Technologies
Sophisticated fluorination technologies such as:
- fluorinations with elemental fluorine (F₂)/ micro reactor fluorinations
- C=O to CF₂ transformations (SF₄)
- Gas and liquid phase fluorination (HF, KF, F₂, NR₃*HF)
- Strong expertise in organic transformations on fluorinated building blocks:
  - Photo-oxidation
  - Halogenations / dehalogenation
  - Amidation
  - Amination
  - Decarboxylation
  - Reduction
  - Friedel Craft’s reaction
  - Others, please contact us for your needs

Agrochemicals, Pharma and Specialties Business Value Proposition and Benefits

Long history and expertise on fluorinated derivatives
- Largest worldwide producer of fluoro-aliphatic derivatives
- Broad and complementary product portfolio
- Only fully back integrated producer from fluospar
- Unique security of supply with multi site production
- Multiple R&D sites, pilot and scale up to develop new molecules from two product trees
- Customer focused product development
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