Organic Fluorinated Building Blocks

Raw materials & Advanced Intermediates
MARKETS & APPLICATIONS

Organic fluorinated building blocks: raw materials & advanced intermediates

The use of organic fluorinated intermediates has grown to become a key component for many block-busters in the agrochemical and pharmaceutical industry.

Using our long-term knowledge, experience and capabilities in fluorine chemistry, we provide you with excellent products based on efficient production processes.

Ca. 30% of drugs and 50% of crop protection products under development contain fluorine. Capitalizing on an extensive expertise in fluorine chemistry, we provide fluorinated molecules, from raw material to active ingredients, based on state of the art production processes.

AGROCHEMICALS

Fluorine confers differentiating biological properties that makes its insertion on organic molecules attractive, as confirmed by the increasing number of fluorinated intermediates under development in the agro science industry (appr. 50%).

We pursue a focus strategy to develop competitive processes that are safe to operate, sustainable and yield the required quality for existing fluorinated molecules for the agrochemicals industry.

We develop new routes to existing commercial fluorinated molecules that are cost competitive thanks to our expertise in fluorine chemistry.

We produce in-house or through our toller network, following the most stringent HSE standards developed at Solvay, based on a technical package released from our research and development center.
INDUSTRIAL APPLICATIONS

Electronic and Coating Additives
Our aliphatic fluorinated building blocks can be used for a variety of applications such as:
- Electronic conducting materials
- Coating materials for flat panel displays, touch screens and finger print scanners

Solvents and Catalysts
Fluorinated acids, alcohols as well as our ketones have excellent solvent properties.
They are used as:
- Solvents in chemical reactions
- Catalyst for silicone and alkylation reaction

PHARMACEUTICALS
We deliver the pharmaceutical industry with fluorinated raw materials from our commercial CF₂/CF₃ product tree.
A growing number of blockbuster drugs contain fluorine atoms:
- Analgesics
- Anesthetics
- Antibiotics
- Anticancer agents
- Antiviral
- Anti-HIV

PRODUCTS
We offer a broad range of fluorinated products such as:
- Trifluoroacetyl chloride
- Trifluoroacetic acid and its derivatives
- Triflic acid and its derivatives
- ETFBO and downstream products
- Fluorinated heterocycles Pyrazoles, Pyrimidinones and Pyridones

CF₂-Key Building Block for Several SDHI Fungicides
DFMPA – 3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxylic acid

Super Acid for Catalysis Needs
TA – Trifluoromethane sulfonic acid or Triflic Acid
Triflic acid is the strongest Brønsted acid available at industrial scale

Building Blocks for Increasing Efficiency of Active Ingredients
TFAC – Trifluoroacetyl chloride
TFA – Trifluoroacetic acid
TFAH – Trifluoroacetic acid anhydride
ETFBO DOWNSTREAM PRODUCTS

- TFPZO 3-(Trifluoromethyl)-1H-pyrazole
- ETFPMOC Ethyl 2-oxo-6-(trifluoromethyl)-1,2-dihydropyridine-3-carboxylate
- TFPMO 6-(Trifluoromethyl)-pyrimidin-2(1H)-one
- ATFBO Family of (Z)-4-(Dialkyl amino)-1,1,1-Trifluorobut-3-en-2-one

TECHNOLOGIES

- Fluorinations with elemental fluorine (F₂)
- Gas and liquid phase fluorination (HF, NR₃*HF)
- Photo-oxidation

ETFBO

4-ETHOXY-1,1,1-TRIFLUORO-3-BUTEN-2-ONE

A versatile intermediate with multiple reactive centers that grant you access to a wide variety of products.
<table>
<thead>
<tr>
<th>Fluorinated Products</th>
<th>Chemical Name</th>
<th>Abbrev</th>
<th>CAS Number</th>
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<tbody>
<tr>
<td><strong>Acid Chlorides</strong></td>
<td>Trifluoroacetyl chloride</td>
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<td><strong>Alcohols</strong></td>
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<td><strong>Alkanes</strong></td>
<td>1,1-Dichloro-2,2,2-trifluoroethane (SOLKANE® 123)</td>
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<td>1,1,1,3,3-Pentafluorobutane (SOLKANE® 365mfc)</td>
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<td><strong>Amines</strong></td>
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<td><strong>Acids</strong></td>
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<td>Trifluoroacetic acid</td>
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<td></td>
<td>Trifluoramethanesulfonic acid</td>
<td>TA</td>
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<td><strong>Anhydrides</strong></td>
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<td>Trifluoramethanesulfonic acid anhydride</td>
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<td><strong>Esters and Acetoacetates</strong></td>
<td>Difluoroacetic acid ethyl ester</td>
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<td>Trifluoroacetic acid ethyl ester</td>
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<td>Trifluoroacetic acid isopropyl ester</td>
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<td>Trifluoroacetic acid methyl ester</td>
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<td><strong>Ketones</strong></td>
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<td><strong>Heterocycles</strong></td>
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<td><strong>Solvents for Li-Ion batteries</strong></td>
<td>Monofluoroethylene Carbonate</td>
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Should you have any questions, please contact us: emea.fluorides@solvay.com
WORLDWIDE PRESENCE

With its two production plants in Europe and a strong tolling network in Asia, Solvay is the largest producer of fluoro-aliphatic derivatives.

Our dedicated R&I Team develops new molecules from two product trees, and tailor-made chemical routes to meet customers’ ambitions.

INDUSTRIAL FOOTPRINT

Salindres | Bad Wimpfen | Tolling network in Asia