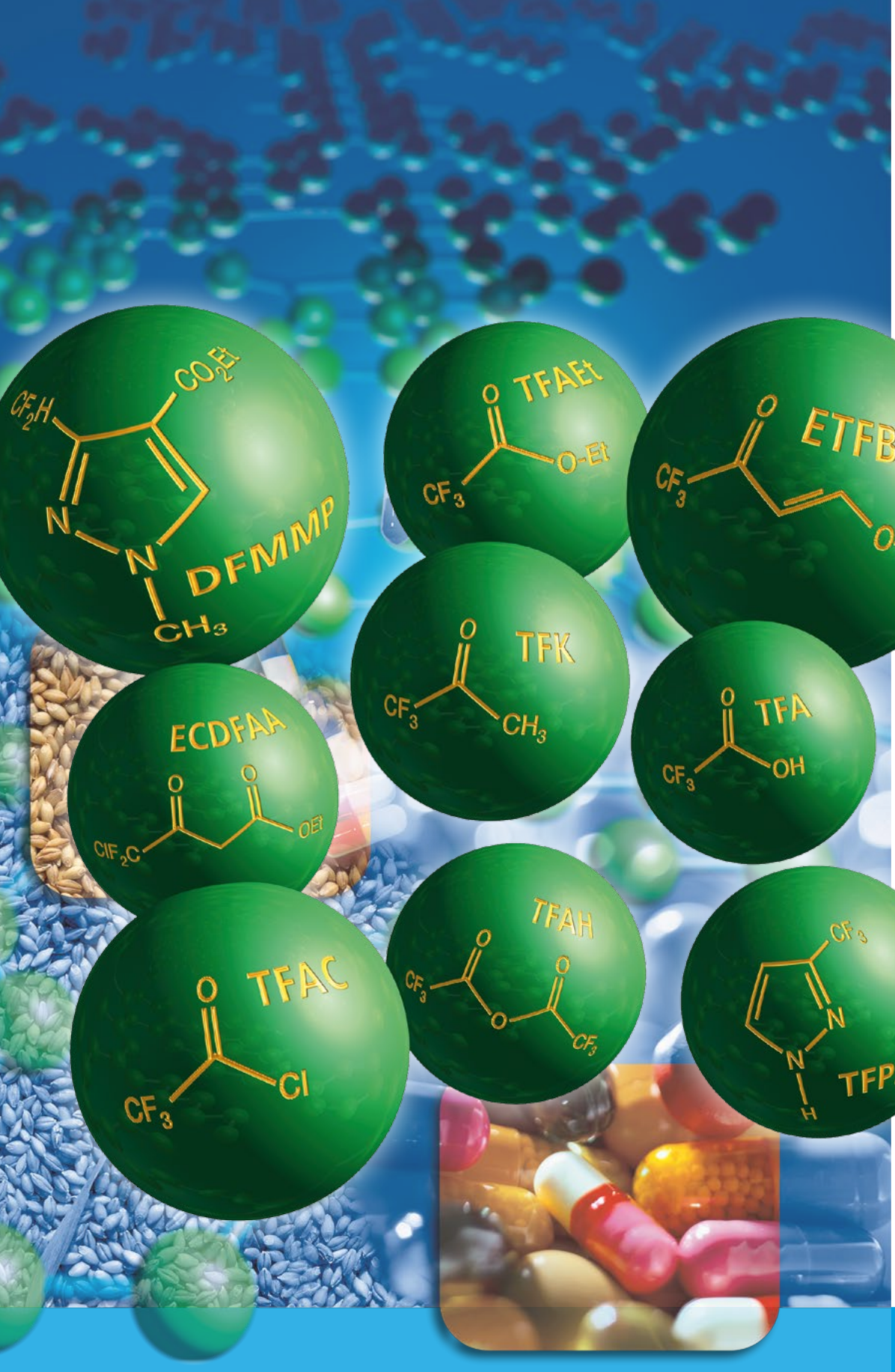


SOLVAY

asking more from chemistry®

# 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 area in the industrial domain and for society as a whole. All business activities involving organic fluorine specialties have been placed in a restructured corporate framework to create a unit better aligned with the broad field of fluororganic chemistry: Organic Intermediates.

Using our longterm 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.

### Solvents and Catalysts

Fluorinated acids, alcohols as well as our ketones have excellent solvent properties. This compounds are used as solvents in chemical reactions, effluents in chromatographic separations and as solvents in polymer applications. Fluorinated alcohols and ketones are applicable as ligands in catalysts, fluorinated acids combine solvent properties with acidic catalyst functions.

### 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
- AntifungalsNR Pharmaceuticals
- 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.

# Organic Fluorinated Intermediates

## Products

We offer a broad range of aliphatic fluorinated specialties such as $CF_3$ and $CF_2$ molecules. One of our latest innovations is ETFBO. This product is a good example 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 chemistry enable us to respond flexibly to your changing needs. Our agrochemical and pharmaceutical customers 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!

| | Chemical Name | Abbrev | CAS Number | Commercially Available | In Development |
|---|---|---|---|---|---|
| **Fluorinated Acid Chlorides** | Chlorodifluoroacetyl chloride | CDFAC | 354-24-5 | | ● |
| | Trifluoroacetyl chloride | TFAC | 354-32-5 | ● | |
| **Fluorinated Alcohols** | 2,2,2-Trifluoroethanol | TFE | 75-89-8 | ● | |
| **Fluorinated Alkanes** | 1,1-Dichloro-2,2,2-trifluoroethane (SOLKANE® 123) | S123 | 306-83-2 | ● | |
| | 1,1,1,3,3-Pentafluorobutane (SOLKANE® 365mfc) | S365mfc | 406-58-6 | ● | |
| **Fluorinated Amines** | 2,2,2-Trifluoroethylamine | TFEA | 753-90-2 | | ● |
| | 2,2,2-Trifluoroethylamine hydrochloride | TFEAxHCl | 373-88-6 | | ● |
| **Fluorinated Acids** | Chlorodifluoroacetic acid | CDFA | 76-04-0 | | ● |
| | Trifluoroacetic acid | TFA | 76-05-1 | ● | |
| | Rac. 2-Trifluoromethyl lactic acid | Rac. TFLA | 382-43-4 | | ● |
| **Fluorinated Anhydrides** | Trifluoroacetic acid anhydride | TFAH | 407-25-0 | ● | |
| **Fluorinated Esters and Acetoacetates** | Difluoroacetic acid ethyl ester | DFAEt | 454-31-9 | | ● |
| | Difluoroacetic acid methyl ester | DFAMe | 433-53-4 | | ● |
| | Ethyl 4-chloro-4,4-difluoroacetoacetate | ECDFAA | 2063-17-4 | | ● |
| | Ethyl 2,2-difluoropentanoate | EDFPe | 136854-22-3 | | ● |
| | Ethyl 2,2-difluoropropanoate | EDFPrA | 28781-85-3 | | ● |
| | Trifluoroacetic acid ethyl ester | TFAEt | 383-63-1 | ● | |
| | Trifluoroacetic acid isopropyl ester | TFAiP | 400-38-4 | ● | |
| | Trifluoroacetic acid methyl ester | TFAMe | 431-47-0 | ● | |
| **Fluorinated Ketones** | 4-Ethoxy-1,1,1-trifluoro-3-buten-2-one | ETFBO | 59938-06-6 | ● | |
| | 1-Chloro-4-ethoxy-1,1-difluoro-3-buten-2-one | ECDFBO | 131153-94-1 | | ● |
| | Heptafluoroisopropyl trifluoromethyl ketone | HFiPTFK | 756-12-7 | | ● |
| | 1,1,1-Trifluoroacetone | TFK | 421-50-1 | ● | |
| **Chiral Fluorinated Building Blocks** | (S)-Trifluoroisopropylamine | S-TFiPA | 125278-10-6 | | ● |
| | (S)-Trifluoroisopropylamine hydrochloride | S-TFiPAxHCl | 125353-44-8 | | ● |
| | (S)-Trifluoroisopropanol | S-TFiP | 3539-97-7 | | ● |
| | (S)-α-Trifluoromethyl lactic acid | S-TFLA | 24435-45-8 | | ● |
| **Fluorinated Heterocycles** | 6-(Trifluoromethyl)-pyrimidin-2(1H)-one | TFPMO | 104048-92-2 | | ● |
| | 3-(Trifluoromethyl)-1H-pyrazole | TFPZO | 20154-03-4 | | ● |
| | Ethyl 3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxylate | DFMMP | 141573-95-7 | | ● |
| | 1H-Pyrazole-4-carboxylic-3-(chlorodifluoro-methyl)-1- methyl-ethylester | CDFMMP | | | ● |
| **Fluorinated Solvents for Li-Ion batteries** | Monofluoroethylene Carbonate | F1EC | 114435-02-8 | ● | |

# Organic Fluorinated Intermediates

## 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.

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

Solvay has been among the market leaders in fluorine chemistry for many years. Our 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 based on TFAC 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 $F_2$, C=O to $CF_2$ transformations as well as C–OH to C–F transformations and asymetric fluorinations are leading-edge technologies we master.

We have expertise in gas and liquid phase fluorination. Our technology range comprises chlorination, bromination, esterification, amidation, amination, decarboxylation, reduction and dehalogenation.

Consider us your first choice provider for organic fluorinated intermediates.

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