

Synthra MeIplus (Catalog No. 003)

Synthra MeIplus is a flexible and completely automated radiosynthesizer for the efficient production of [^{11}C]-labeled compounds based on the generation of gas-phase production of [^{11}C]methyl iodide and [^{11}C]methyl triflate. Automating the synthesis is simple with the easy-to-use configuration software SynthraView. The Synthra MeIplus module offers both, fully automatic and manual modes of operation.

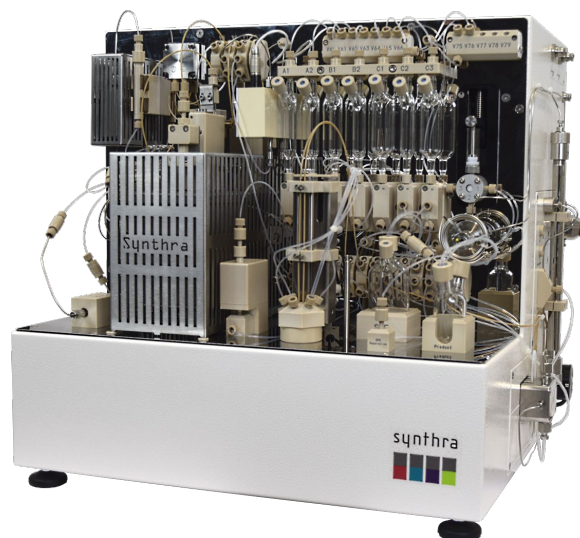
Gas Phase Capabilities

- ✓ High specific activities are achieved from in-target produced [^{11}C]CO₂ ranging from 5 Ci/ μmol to 20 Ci/ μmol (Higher specific activities are possible when using methane target).

The [^{11}C]CO₂ produced in target is quantitatively trapped in the stainless steel capillary tubing at -180 °C. Subsequently, the [^{11}C]CO₂ is released into the methane oven where it is converted to [^{11}C]CH₄ by reduction on a Ni-catalyst. The [^{11}C]CH₄ is trapped at -120 °C on Carboxen[®]. In a successive gas phase reaction the iodination of [^{11}C]CH₄ to [^{11}C]MeI is carried out in a gas phase recirculation system with gaseous I₂ at 730 °C. During circulation [^{11}C]MeI accumulates on a Porapak[™] column. Finally, it is released at 200°C and ready for any kind of labeling reaction.

[^{11}C]Labeling Possibilities

- ✓ **[^{11}C]Methyl iodide production:** [^{11}C]MeI is ready for release 7 minutes after trapping the [^{11}C]CO₂. The yield for the [^{11}C]methyl iodide formation is under good conditions above 50 % non-decay corrected (ndc).
 - Up to 10 sequential methyl iodide preparations are possible from a single box set-up.
- ✓ **Methyl triflate production:** The [^{11}C]MeI can be converted to [^{11}C]MeOTf by passing through a silver triflate filled column at 180 °C. The conversion yield from methyl iodide is 95 %.
 - Both [^{11}C]MeI and [^{11}C]MeOTf can be used for solid support heterogeneous reactions (e. g. [^{11}C]choline, [^{11}C]methionine) or can be released into the reaction vessel for homo-geneous reactions.
- ✓ **Acetate production:** The purified [^{11}C]CO₂ is passed into the reaction vessel for Grignard reactions.



General Features

- ✓ **Heating and cooling capabilities**
 - Eight heating zones
 - Five with cooling capabilities
 - Temperature range: -196 °C – 950 °C
- ✓ **Detectors and controllers**
 - Six shielded radiation detectors
 - Three electronic flow controllers
 - Three pressure sensors
- ✓ **Dispensers and valves**
 - HR-dispenser (up to 50.000 steps, 2.5/5 mL)
 - HPLC pneumatic injection valve (1.5 mL sample loop)
 - Three spare valves for customization
 - Chemically inert valves with small dead volume < 35 μL , 5 bar rated
- ✓ **Self-cleaning system**
- ✓ **Dimensions** (w x d x h): 52 x 50 x 48 cm
- ✓ **Weight:** approx. 40 kg

Synthra C-11 Family

Product Description and Technical Specifications

synthra



Synthesis Features

- ✓ **Closed 3 mL reaction vessel** (-196 °C – 200 °C) with integrated cooling to reduce synthesis time (min. volume: 50 µL)
- ✓ **Triflate/column oven** (RT – 200 °C)
- ✓ **Seven reagent vials**
 - Five small (1 – 3 mL) and two large (10 – 15 mL) volume glass vials for reagents
- ✓ **One additional cartridge holder**
- ✓ **Built-in preparative radio/UV-HPLC system** for in-process purification and final product collection (max flow: 40 mL/min)
 - Fixed wavelength LED detector with 255 nm or 280 nm
 - Optional: Quaternary gradient
 - One HPLC semi-preparative column
- ✓ **SPE unit** for final product formulation

- ➔ **[¹¹C]CO** (Catalog No. 003co): After purification, the [¹¹C]CO₂ is released into the column oven for Zn- or Mo-catalyzed reduction to [¹¹C]CO.
- ➔ **Loop option** (Catalog No. 003lo): A heatable and coolable reaction loop is integrated in the synthesis route to reduce synthesis time.
- ➔ **Product solvent evaporator** (Catalog No. 000pse)
- ➔ **Variable wavelength UV detector** (Catalog No. 000vuv)

Additional Synthesis Options

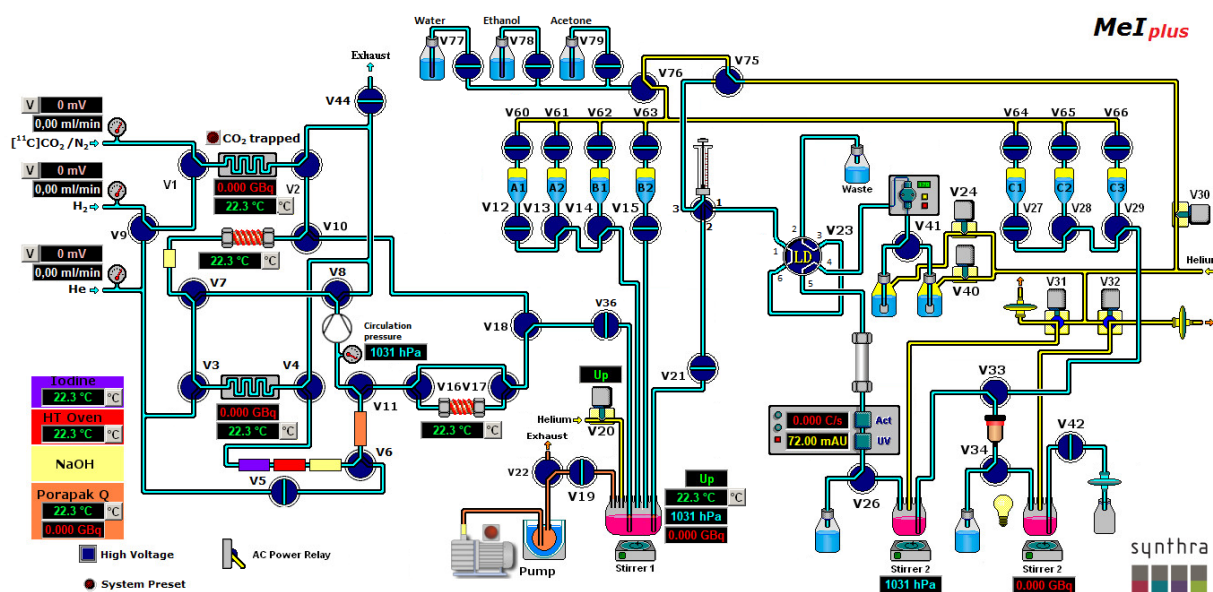
- ➔ **Methane option:** A reduced gas phase suitable for the use of CH₄ target

GMP Features

- ✓ Synthesis files for several [¹¹C]radiotracers like methionine and PIB available
- ✓ **GMP compliant.** Electronic control and data collection (27/18 channels)
- ✓ **21CFRpart11** & **LIMS** compatible

Terminal Control

- ✓ A laptop (Win 10 Pro) with preinstalled controlling software SynthraView is included
- ✓ Four digital inputs for communication with external devices upon request



The Graphical User Interface (GUI) of the SynthraView software.