

Synthra Melplus Research (Catalog No. 003r)

Synthra MeIplus Research 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. It is specially designed to perform the required multi-step synthesis for using [^{11}C]HCN or [^{11}C]propylation reactions. Automating the synthesis is simple, with the easy-to-use configuration software SynthraView. The Synthra MeIplus Research module offers both, fully automatic and manual modes of operation.

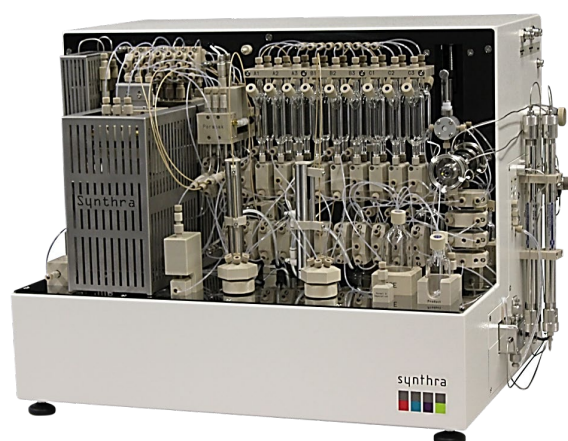
Gas Phase Capabilities

- ✓ High specific activities are achieved from in-target produced [^{11}C]CO₂ ranging from 10 Ci/ μmol to 24 Ci/ μmol .*

The target [^{11}C]CO₂ is quantitatively trapped in the stainless steel capillary tubing at -180 °C. After washing out the impurities the CO₂ is released into the methane oven where it is converted to [^{11}C]CH₄ by reduction on a Ni catalyst. Subsequently, the [^{11}C]CH₄ is released and trapped at -120 °C on Carboxen® CH₄ trap and unreacted hydrogen is removed from the system. In a successive gas phase reaction the [^{11}C]CH₄ is converted into [^{11}C]MeI and trapped on a Porapak Q filled column.

[^{11}C]Labeling Possibilities

- ✓ **[^{11}C]Methyl iodide Production:** [^{11}C]MeI is ready to be released after 7 minutes starting from the [^{11}C]CO₂ trapping. The yield for the [^{11}C]MeI formation is better than 50% (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 homogeneous reactions.
- ✓ **Acetate Production:** The purified [^{11}C]CO₂ is passed into the reaction vessel for Grignard reactions.



Additional Synthesis Options

- ➔ **Methane Option:** A reduced gas phase suitable for the use of CH₄ Target.
- ➔ **[^{11}C]CO** (Catalog No. 003CO): After purification, the [^{11}C]CO₂ is released into the column oven for Zn- or Mo-catalyzed reduction to [^{11}C]CO.
- ➔ **[^{11}C]HCN** (Catalog No. 003HCN): The [^{11}C]CH₄ is released with NH₃ gas into a high temperature area where it undergoes a Pt-catalyzed conversion into [^{11}C]HCN at 950 °C.
- ➔ **Loop Option** (Catalog No. 003LO): A heatable and coolable reaction loop is integrated in the synthesis route to reduce synthesis time.

*Higher specific activities are possible when using methane target.

Synthra C-11 Family

Product Description and Technical Specifications

synthra



General Features

- ✓ **Heating and Cooling Capabilities**
 - 9 heating zones
 - 6 with cooling capabilities
 - Temperature range: -196 °C – 950 °C
- ✓ **Detectors and Controllers**
 - 6 shielded radiation detectors
 - 1 leak detector
 - 3 electronic flow controllers (HCN option: 4 flow controller)
 - 4 Pressure sensors + 1 filter test unit
- ✓ **Dispensers and Valves**
 - HR-dispenser (up to 50.000 steps, 2,5/5 mL)
 - HPLC pneumatic injection valve (0.5 mL to 2.5 mL sample loop)
 - 5 spare valves for customization
 - Chemically inert valves with small dead volume < 35 µL, 5 bar rated
- ✓ **Self-Cleaning System option**
- ✓ **2 additional Cartridge holders**
- ✓ **Built-in preparative Radio/UV-HPLC system** for in-process purification and final product collection (max flow: 40 mL/min)
 - Fixed wavelength detector with 254 nm or 280 nm
 - Quaternary gradient
 - 1 HPLC semi-preparative column
- ✓ **SPE Unit** for final product formulation
- ✓ **Further Options:**
 - ➔ Product vial heater option (Catalog No. 000ph)
 - ➔ Variable wavelength UV Detector option (Catalog No. 000vuv)

Synthesis Features

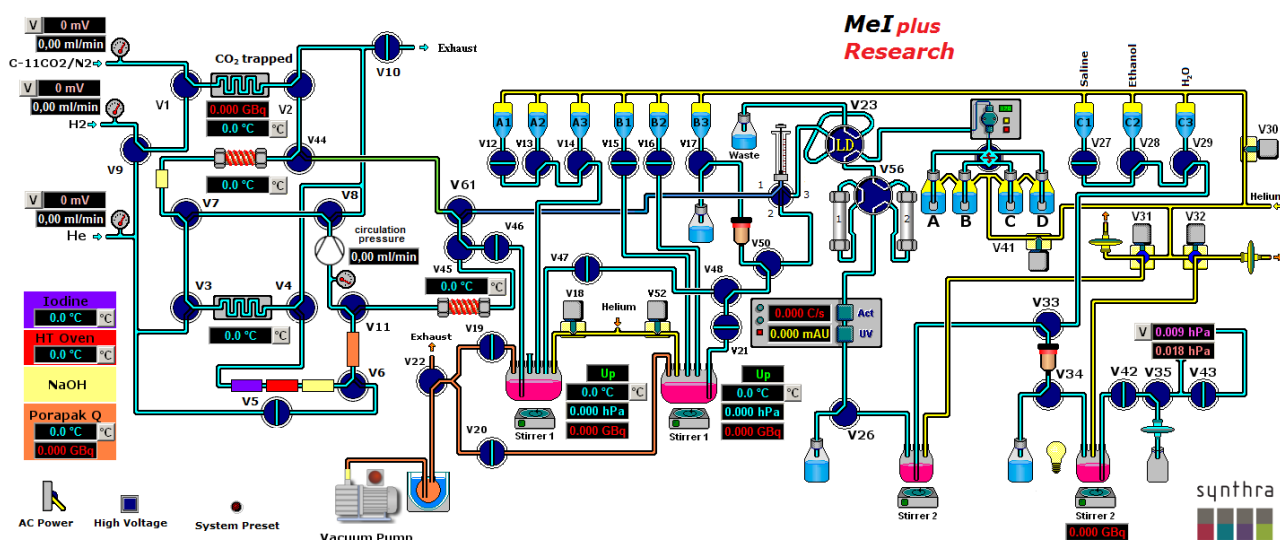
- ✓ **2 closed reaction vessel** (-196 °C – 250 °C) with integrated cooling to reduce synthesis time
 - 3 mL reaction vessel (minimum volume: 50 µL)
- ✓ **Triflate/Column oven** (RT – 200 °C)
- ✓ **9 reagent vials**
 - Seven small (1 – 3 mL) and two large (10 - 15 mL) volume glass vials for reagents

GMP Features

- ✓ Synthesis files for > 6 [¹¹C]radiotracers
- ✓ **GMP compliant.** Electronic control and data collection (27/18 channels)
- ✓ **21CFRpart11 & LIMS** compatible

Terminal Control

- ✓ **A Laptop (Win 10 Pro) and SynthraView are included**



The Graphical User Interface (GUI) of the SynthraView software