

Synthra MeIplus Reaction Loop (Catalog No. 003I)

Synthra MeIplus Reaction Loop 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 Reaction Loop 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%.
 - The [^{11}C]methyl iodide or [^{11}C]methyl triflate can either be directed into **the loop for homogeneous captive chemistry reactions** developed by Alan Wilson or can be used for **solid support reactions** for the synthesis of e.g. [^{11}C]methionine.
 - The **conversion efficiency** of the loop system is better than 95%. Labelling efficiency is depending on the quality of the precursor solution.



- ✓ **Acetate Production:** The purified [^{11}C]CO₂ is passed into the reaction vessel for Grignard reactions.

Additional Gas Phase Option:

- ➔ **Methane Option:** A reduced gas phase suitable for the use of CH₄ Target.

*Higher specific activities are possible when using methane target.

General Features

- ✓ **Heating and Cooling Capabilities**
 - 8 heating zones
 - 5 with cooling capabilities
 - Temperature range: -196 °C – 1000 °C
- ✓ **Detectors and Controllers**
 - 6 shielded radiation detectors
 - 1 leak detector
 - 3 electronic flow controllers (HCN option: 4 flow controller)
 - 3 Pressure sensors + 1 filter test unit

Synthra C-11 Family

Product Description and Technical Specifications

synthra



- ✓ **Dispensers and Valves**
 - HPLC pneumatic injection valve (1.5 mL sample loop)
 - 3 spare valves for customization
 - Chemically inert valves with small dead volume < 35 µL, 5 bar rated

- ✓ **SPE Unit** for final product formulation
- ✓ **Synthesis Options:**
 - ➔ Product vial heater option (Catalog No. 000ph)
 - ➔ Variable wavelength UV Detector option (Catalog No. 000vuv)

Synthesis Features

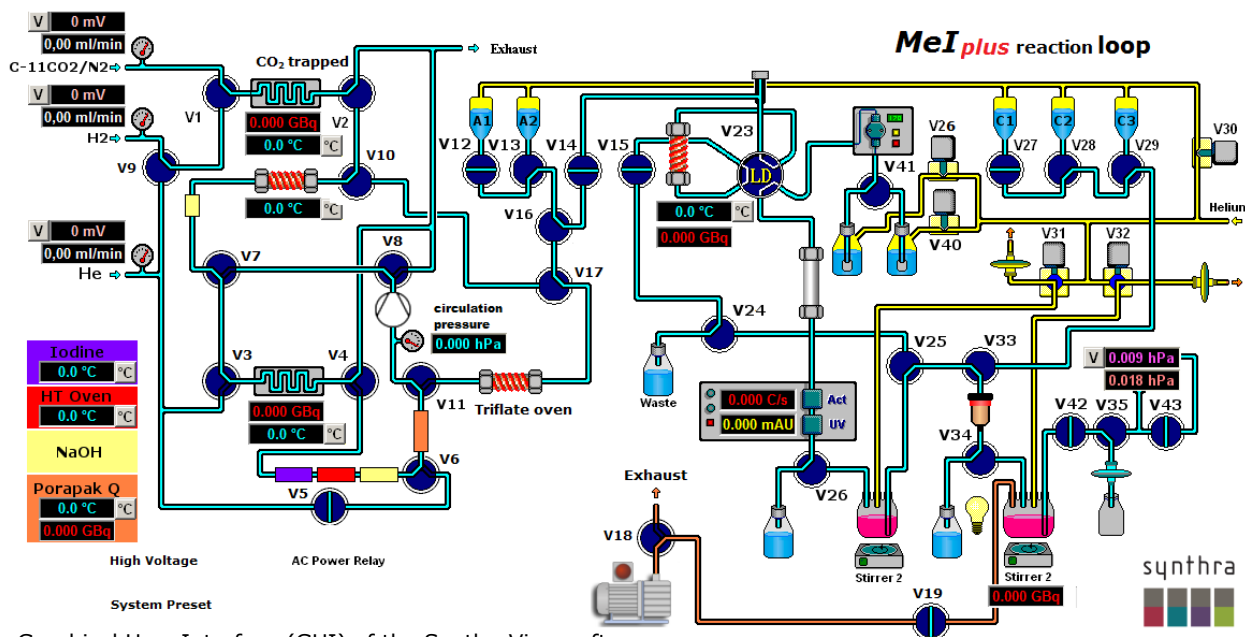
- ✓ **Closed reaction loop** with integrated cooling (-180 °C – 200 °C) to reduce synthesis time
- ✓ **Triflate/Column oven** (RT – 200 °C)
- ✓ **5 reagent vials**
 - Three small (1 – 3 mL) and two large (10 – 15 mL) volume glass vials for reagents
- ✓ **1 additional Cartridge holder**
- ✓ **Built-in preparative Radio/UV-HPLC system** with isocratic pump for in-process purification and final product collection (max flow: 40 mL/min)
 - Fixed wavelength LED detector with 254 nm or 280 nm
 - Optional: Quaternary gradient
 - 1 HPLC semi-preparative column

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