

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 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 %.
 - 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 %. Labeling efficiency is depending on the quality of the precursor solution.
- ✓ **Acetate production:** The purified [^{11}C]CO₂ is passed into the reaction loop 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
 - Two Pressure sensors
- ✓ **Dispensers and valves**
 - HPLC pneumatic injection valve (1.5 mL sample loop)

Synthra C-11 Family

Product Description and Technical Specifications

synthra



- Three spare valves for customization
- Chemically inert valves with small dead volume < 35 µL, 5 bar rated
- ✓ **Dimensions** (w x d x h): 52 x 50 x 48 cm
- ✓ **Weight:** approx. 40 kg

Synthesis Features

- ✓ **Capillary reaction loop** with integrated cooling (-196 °C – 200 °C) to reduce synthesis time
- ✓ **Triflate/column oven** (RT – 200 °C)
- ✓ **Five reagent vials**
 - Three 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** with isocratic pump 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

Additional Synthesis Options

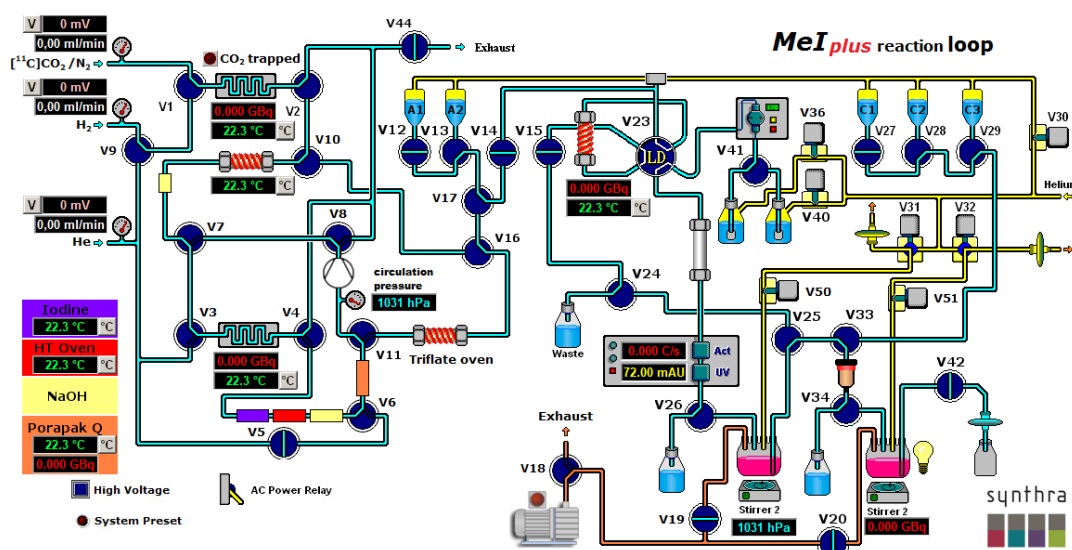
- ➔ **Methane Option:** A reduced gas phase suitable for the use of CH₄ target.
- ➔ **Product solvent evaporator** (Catalog No. 000pse)
- ➔ **Variable wavelength UV detector** (Catalog No. 000vuv)

GMP Features

- ✓ Synthesis files for several tracers are 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.