



Procedure n°5:

Adding pentane into the thermodynamic system

Froilabo
Precision for life

I) Required tools and preconditions



It is highly recommended to make realize this operation by a **qualified refrigeration technician**.

When the temperature stays unusually higher than -80°C (between -60°C and -75°C for example), stop the freezer during one day. Start it again, and if the freezer can then reach temperature below -80°C , it is advised to add pentane inside the 2nd stage thermodynamic system to solve the problem.

To perform this procedure, you are going to need:

- ✓ Pentane (at least 95% purity <https://fr.vwr.com/store/product/738396/n-pentane-95-technical>)
- ✓ 50cm³ graduated tank
- ✓ Flexible pipe
- ✓ Manifold
- ✓ 4mm BTR key

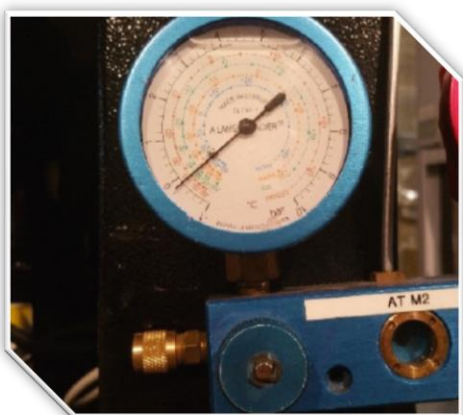
II) Freezer preparation

Disassemble lateral and back frame panels in order to access to the compressor stage.

TIPS: Put the panels aside in order to prevents any damages.



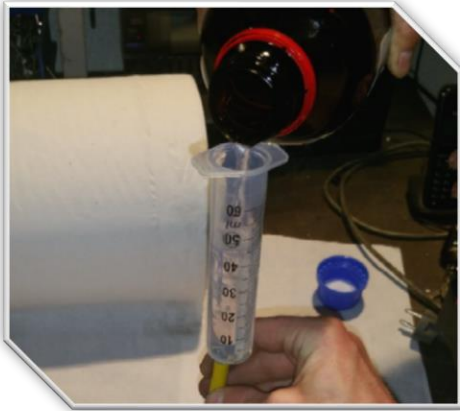
- Stop the compressor to let the HP and LP equalize.
- Connect the manifold at the low-pressure side (CP2) as shown on the picture.
- Draw to vacuum manifold + flexible to avoid **the presence of air inside the system**.



- When the manifold is connected, set the setpoint at -90°C and make the compressors run.
- Now you must wait that the LP went down under 0 bar (relative pressure) as shown on the manifold on the right. It means that inner chamber temperature should be less than -80°C .

III) Adding pentane

Once the pressure is under 0 bar, pentane tank can be prepared.



- Put tank / flexible assembly upright.
- Gently fill the tank / flexible assembly up to the 50mL graduation.

Make sure there is no air bubbles in the pentane!!!



- Connect the **flexible hose** to the manifold.
- Remove the piston and open the BP valves (to connect the **blue** and **yellow** flexible contents to the system). The pentane is then sucked with the low pressure. Stop the injection (close the BP valve) when **40 cm³ of pentane** are added (from 50mL to 10mL on the tank graduation)

Flexible

- Let the compressors run and wait.
- Disconnect the hoses from the manifold carefully.

After several hours, the internal temperature of the chamber should reach -80°C.

- Remove the manifold.
- Replace the panels on the bottom frame.

CAUTION: FAILURE TO FOLLOW INSTRUCTIONS ABOVE CAN DAMAGE YOUR UNIT.

Refer to [« User manual »](#) provided with the unit for more information.