

Lab Experiment – Liquifying a Gas

Use a plastic syringe to compress a gas (butane) until it liquifies (state of matter vs pressure, heat of vaporization, refrigeration principles)

Prepare the Hardware:

- Use a disposable polypropylene syringe (an all-polypropylene plunger is preferred over one that has a rubber part).
- Briefly heat the Luer tip of the syringe with a flame (don't burn it)
- While hot, press the tip against a flat surface (fold the tip over) and let it cool
- If done correctly, that will seal the end

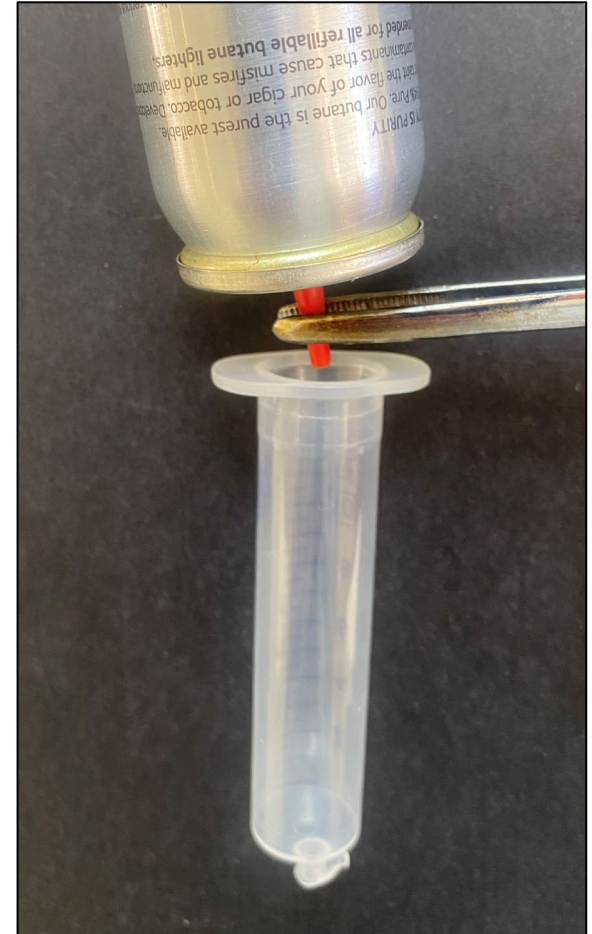


Sealed

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Fill with Butane:

- Use butane from a canister typically used to refill small butane torches
- Turn the canister upside down, point it into the syringe body and open the valve (press it in) – use pliers to do this (**cold burns can occur from touching the liquid butane**)
- Liquid butane will come out of the nozzle, and some will collect in the syringe (as the liquid evaporates the gas produced will displace the air in the syringe)
- Insert the plunger at just the moment when the last bit of liquid evaporates
- Ready!



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Do the Experiment:

- Push the syringe barrel in, at some point liquid will be seen to condense
- Allow the liquid to cool, then let the plunger go out
- The liquid will boil
- Touch the syringe after the compression and after the decompression to feel the temperature changes

