Gas Collection

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Objective: Determine the molar mass and the identity of the gas inside of a typical lighter.

Procedure:

1. Mass the lighter (remove tube).
2. Fill eudiometer (gas collection tube).
3. Invert tube into water.
4. Add the tube to lighter. With a dry hand align tube to under the water to dispense gas into gas collection tube which is under water. Only tube can go under the water. Not the lighter.
5. Watch the video to clarify instructions. <https://www.youtube.com/watch?v=KUEPoWUe7CU&feature=youtu.be>
6. Add enough gas so the volume of water inside the tube matches the water level outside of the tube.
7. Re-mass the lighter. (remove tube)
8. Measure volume of gas in gas collection tube.
9. Measure the temperature.
10. Calculate the molar mass.

Note: Vapor pressure of water at room temperature is 23.6mmHg = 0.031 atm

Options of possible substances in the lighter

|  |  |
| --- | --- |
| Data | Value |
| Mass before |  |
| Mass after |  |
| Mass total |  |
| Temperature (K) |  |
| Atmospheric pressure |  |
| Vapor pressure |  |
| Pressure dry air |  |

Methane Ethane Propane Butane Isobutene Pentane

Questions:

1. Draw a Lewis structure for each of these substances.
2. Calculate the molar mass of each known substance.
3. Calculate the pressure of the dry air.
4. Calculate the molar mass the unknown substance.
5. What is you unknown substance?
6. Are you 100% sure of your answer… Why or why not?
7. If a person does not subtract the vapor pressure, this will cause the new calculated Molar mass to be (higher/Lower).