

Investigating the relationship between pressure and temperature. for a fixed mass of gas at a fixed volume

Apparatus

Round bottom flask containing screwed up aluminium foil, stopper, Bourdon Guage or pressure sensor, thermometer, ice, kettle, water. large containment beaker, heat source

Background

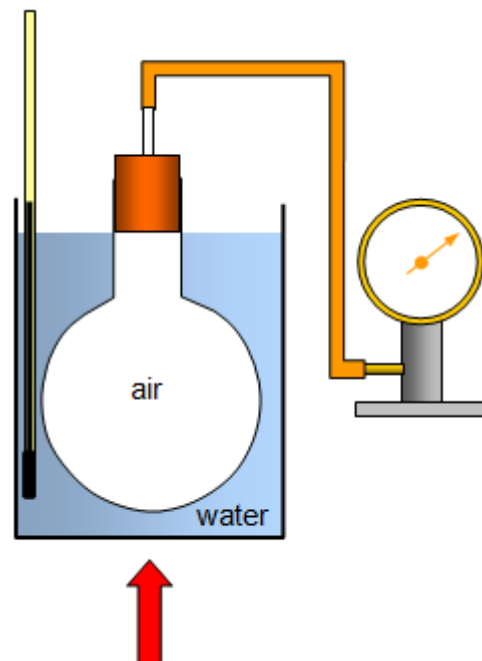
According to the kinetic theory, the average speed of the gas particles increases with increasing temperature. The hotter the gas, the faster the gas particles are moving.

Instructions

- Add boiling water to the beaker, and note the temperature and corresponding pressure.
- The flask was removed from the beaker and allowed to cool to room temperature.
- As the air cooled, collect values for temperature and pressure.
- Add ice to the large beaker to increase the range of temperatures over which the experiment can be run.
- NB Why should the pipe from the round bottom flask to the Bourdon Guage be as small as possible

Risk Assessment

- Wear safety goggles when carrying out this experiment.
- The water can be hot, be careful with hot equipment and always move the hot water from the kettle to the beaker. Do not attempt to move hot beakers.
- Secure all equipment so that it cannot fall.



Research

- http://tap.iop.org/energy/kinetic_theory/page_40478.html
- http://www.schoolphysics.co.uk/age16-19/Thermal%20physics/Gas%20laws/text/Gas_laws/index.html
- http://tap.iop.org/energy/kinetic_theory/page_40464.html
- <http://www.iop.org/search/results?search=gas%20laws&resultcount=10&sortspec=score+desc&source=tap&sourcequerytext=%28url%20%3Ccontains%3E%20tap.iop.org%29&resultstart=1>
- http://www.bbc.co.uk/bitesize/higher/physics/mech_matt/gaslaws/revision/1/
- <http://www.physbot.co.uk/gas-laws.html>
- <https://physics.info/gas-laws/>
- http://www.bbc.co.uk/schools/gcsebitesize/science/triple_edexcel/kinetic_theory_gases/kinetic_theory_gases/revision/1/
- <http://passmyexams.co.uk/GCSE/physics/pressure-temperature-relationship-of-gas-pressure-law.html>
- <http://practicalphysics.org/boyles-law.html>
- <http://practicalphysics.org/variation-gas-pressure-temperature.html>
- <http://practicalphysics.org/thermal-expansion-air-charles-law.html>