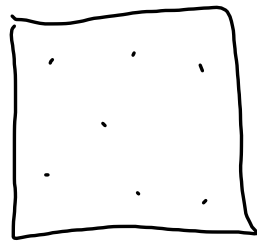


PBL: How Ideal
is the Ideal Gas
Law?

$$PV = nRT$$



container volume
 $= V$
volume available
to gas $= V - nb$
 $b =$ molar volume

$$P = \frac{nRT}{V} \quad \text{ideal gas}$$

$$P = \frac{nRT}{V - nb} \quad \text{volume correction}$$

$$P = \frac{nRT}{V - nb} - a\left(\frac{n}{V}\right)^2$$

$$P + a\left(\frac{n}{V}\right)^2 = \frac{nRT}{V - nb}$$

$$\left(P + a\left(\frac{n}{V}\right)^2\right)(V - nb) = nRT$$

$$P \cdot V = nRT$$

Does the ideal gas law work better at high temperatures or low temperatures?

Does the ideal gas law work better when the pressure is high or when the pressure is low?

Is there any trend among similar gases?

Intro.

Theoretical Background

Effect of Temperature on Gas Ideality

Effect of Pressure on Gas Ideality

Trends in non-ideal Behavior in similar gases