



# WHAT MAKES GASES REAL

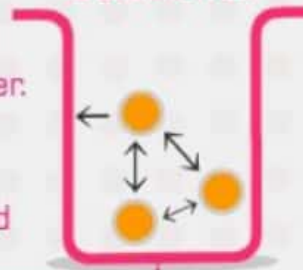


## DEVIATION FROM IDEAL GAS



### Pressure Correction

Pressure is one force applied by an ideal gas on one container. In real gas, molecules have attraction between them, thus reducing the force applied on container



$$P_{\text{real}} = P_{\text{ideal}} - \frac{an^2}{V^2}$$

### Volume Correction

For ideal gas, V is equal to volume of container. However in real gases molecules occupy considerable volume



$$V_{\text{real}} = V_{\text{ideal}} + nb$$

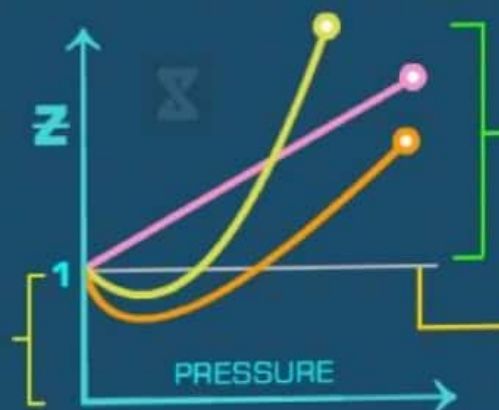
$$\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$$

Vander Waal Equation

## IS Z A REAL DETECTOR?

$$Z < 1$$

- Deviates from ideal gas behaviour
- Attractive forces dominate repulsive forces



$$Z > 1$$

- Deviates from ideal gas behaviour
- Repulsive forces dominate attractive forces

$$Z = 1 \Rightarrow \text{ideal gas}$$

AT LOW PRESSURE & HIGH TEMPERATURE real gas acts as ideal gas

### HELIUM & HYDROGEN

They are lighter gases. So force of attraction is less. therefore they have always

$$Z > 1$$

### VANDER WAAL'S CONSTANT

a - measure of average attraction of gas molecules  
b - proper volume of gas molecules. It is actually 4 times volume of single molecule.

