

## Molar Volume of Some Gases

Temperature 273.15 K = 0°C = approx. freezing temp. of water

Pressure  $10^5$  pascal = atmos. pressure at sea level

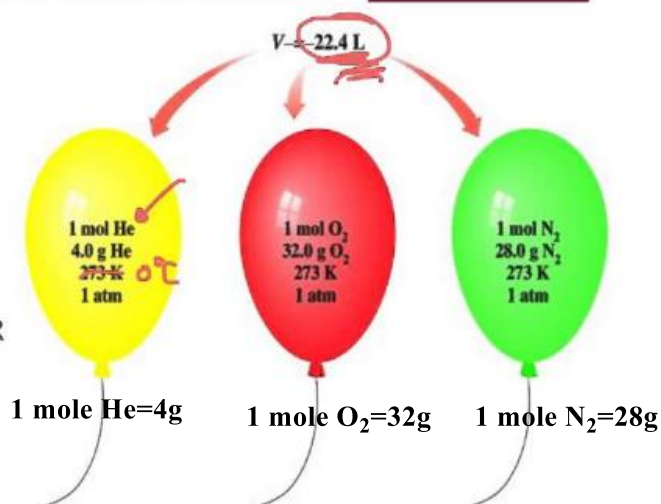
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At STP **molar volume** of an ideal gas or a combination of ideal gases is 22.7 L/mol.

## Molar Volume

### The molar volume of a gas

- Is measured at STP (standard temperature and pressure).
- Is **22.4 L** for 1 mole of any gas.



STP = T = 0 °C, P = 1 Atmospheric Pressure

**STP**  
STANDARD TEMPERATURE  
and PRESSURE

P = 1 atm  
= 760 mmHg  
= 101.3 kPa

T = 273 K  
= 0°C

$$PV = nRT$$

$$V = \frac{nRT}{P}$$

$$V = \frac{(1 \text{ mol}) \left(0.0821 \frac{\text{Latm}}{\text{molK}}\right) (273\text{K})}{1 \text{ atm}}$$

V = 22.4 L Voila!