22. Gaseous State BSc-H Semester-1

Lecture-22

Slide-22

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GLL
PαT at constt Volume

Avogadro Law (Volume-Amount Relationship)

Italian scientist Amedeo Avogadro [1811] tried to combine conclusions of Dalton's atomic theory and Gay Lussac's law of combining volumes

Avogadro law

It states that equal volumes of all gases under the same conditions of temperature and pressure contain equal number of molecules. Meaning that ...When T and P constant

Then Vα no of molecules of the gas [n]

or α amount of the gas [n].

$$V \propto n \qquad \text{When T and P constant}$$

$$\Rightarrow V = k_4 n \qquad\qquad (5.11)$$

The number of molecules in one mole of a gas has been determined to be $6.022 \; 10^{23}$ and is known as Avogadro constant

$$1 \text{ mole} = 6.022 \; 10^{23} \text{ particles}$$

1mole of each gas at STP will have same volume

$$V \propto n$$

1n = 1mole = 1 mole of each Gas occupies a constant volume at STP

= 22.4 L [molar volume of N_2=28g/mole, present in 22.4L**]**

= 22.4 L has = 1 mole = 6.022×10^{23}particles and

= contains 1molar volume of any gas