

India's Number 1 Education App

CHEMISTRY

NCERT - NCERT CHEMISTRY(HINGLISH)

STATES OF MATTER

Solved Example

1. A ballon is filled with hydrogen at room temperature. It will burst if pressure exceeds 0.2 bar. If at *I* bar pressure, the gas occupies

2.27L volume, up to what volume can the

balloon be expanded?



2. when a ship is sailing in Pacific Ocean where temperature is $23.4^{\circ}C$, a ballon is filled with 2.0 L of ship reaches Indian Ocean where temperature is $26.1^{\circ}C$?

3. At $25^{\circ}C$ and 760 mm of Hg pressure a gas occupies 600 mL volume. What will be its pressure at a height where temperature is $10^{\circ}C$ and volume of the gas is 640 mL.

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4. A neon-dioxygen mixture contains 70.6 g dioxygen and 167.5 g neon. If pressure of the mixture of gases in the cylinder is 25 bar. What

is the partial pressure of dioxygen and neon in

the mixture ?



5. Gases possess characteristic critical temperature which depends upon the magnitude of intermolecular forces between the gas particles. Critical temperatures of ammonia and carbon dioxide are 405.5 K and 304.10 K respectively. Which of these gases will

liquify first when you start cooling from 500 K

to their critical temperature ?





1. What will be the minimum pressure required to compress 500 dm^3 of air at 1 bar to 200 dm^3 at $30^\circ C$?

2. A vessel of 120 mL capacity contains a certain amount of gas at 1.2 bar pressure and $35^{\circ}C$. The gas is transferred to another vessel of volume 180 mL at $35^{\circ}C$. What would be its pressure?

3. Using the equation of state pV = nRT, show that at a given temperature the density of gas is proportional to gas pressure p.



4. At $0^{\circ}C$ the density of a gaseous oxide at 2 bar is same as that of nitrogen at 5 bar What is the molecular mass of the oxide ? .

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5. Pressure of 1g of an ideal gas A at $27^{\circ}C$ is found to be 2 bar when 2g of another ideal gas B is introduced in the same flask at same temperature the pressure becomes 3 bar. Find a relationship between their molecular masses



6. The drain cleaner Drainex contains small bits of aluminium which react with caustic soda to produce hydrogen What volume of hydrogen at $20^{\circ}C$ and one bar will be released when 0.15g of aluminium reacts ? .



7. What will be the pressure exerted by a mixture of 3.2g of methane and 4.4g of carbon dioxide contained in a $9dm^3$ flask at $27^\circ C$?

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8. What will be the pressure of the gas mixture when 0.5L of H_2 at 0.8 bar 2.0L of oxygen at 0.7 bar are introduced in a 1L vessel at $27^{\circ}C$? **9.** Density of a gas is found to be $5.46/dm^3$ at $27^{\circ}C$ at 2 bar pressure What will be its density at STP?



10. 34.05mL of phosphorus vapours weighs

0.0625g at $546\,^\circ C$ and 0.1 bar pressure. What

is the molar mass of phosphorus ?

11. A student forgot to add the reaction mixture to the round bottomed open flask at $27^{\circ}C$ and put it on the flame After a lapse of time he realized his mistake using a pyrometer he found the temperature of the flask was $477^{\circ}C$ What fraction of air would have been expelled out ? .

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12. Calculate the temperature of 4.0 mol of a gas occupying d dm^3 at 3.32 bar. (R=0.083 bar

 $dm^3K^{-1}mol^{-1}).$ Watch Video Solution

13. Calculate the total number of electrons present 1.4 g of dinitrogen gas.

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14. How much time would it take to distribute one Avogadro number of wheat grains, if 10^{10} grains are distributed each second?



15. Calculate the total pressure in a mixture of 8g of oxygen and 4g hydrogen confined in a vessel of $1dm^3$ at $27^\circ C$. $(R = 0.083 \text{bar} dm^3 K^{-1} mol^{-1})$

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16. Pay load is defined as the difference between the mass of displaced air and the

mass of the balloon Calculate the pay-load when a balloon of radius 10m mass 100kg is filled with helium at 1.66 bar at $27^{\circ}C$ (Density of air $= 1.2kgm^{-3}$ and R = 0.083 nar $dm^{-3}K^{-1}mo1^{-1}$).

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17. Calculate the volume occupied by 8.8 g of CO_2 at $31.1^{\circ}C$ and 1 bar pressure. R= 0.083 bar L $K^{-1}mol^{-1}$.

18. 2.9*g* of a gas at $95^{\circ}C$ occupied the same volume as 0.184g of hydrogen at $17^{\circ}C$ at same pressure What is the molar mass of the gas ? .

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19. A mixture of hydrogen and oxygen at 1 bar pressure contains 20% of hydrogen by weight. Calculate the partial pressure of hydrogen.



- 21. In terms of Charles' law, explain why
- $-273\,^\circ\,C$ is the lowest possible temperature?



22. The critical temperatures of carbon dioxide and methane are $31.1^{\circ}C$ and $-81.9^{\circ}C$, respectively. Which of them has stronger intermolecular forces and why?

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23. Explain the physical significance of

vanderWaals parameters.