KINETIC THEORY OF GASES

Q.1. Value of (P/ρ) of ideal gas at 27 ^{0}C is 12. Find (P/ρ) value at 127 ^{0}C.

A. 16

B. 15

C. 14

D. 12

Q.2. Pressure of a gas at 27 ^{0}C is 2 atm. Find pressure of gas if final temperature is 627 ^{0}C.

A. 4 atm

B. 3 atm

C. 2 atm

D. 6 atm

Q.3. At constant volume, temperature of a sample is changed by 5 ^{0}C. Its pressure changes by 2 %. Find its initial temperature.

A. 230 K

B. 250 K

C. 210 K

D. 270 K

Q.4. A balloon contains 200 ml He at pressure 2 atm and temperature 27 ^{0}C. Find volume of He if final pressure is 1 atm and temperature - 3 ^{0}C.

A. 360 mL

B. 350 mL

C. 340 mL

D. 390 mL

Q.5. 12 g oxygen is contained in a closed container at 2 atm and 127 ^{0}C. A small hole is made so that oxygen leaks out. Find amount of oxygen leaked if final pressure is 1 atm and temperature is 27 ^{0}C.

A. 1 g

B. 4 g

C. 3 g

D. 5 g

Q.6. Air is contained in an open mouth vessel at 27 ^{0}C. Now this vessel is heated upto a temperature T so that (1/4) part of air escapes out. Find T.

A. 400 K

B. 200 K

C. 300 K

D. 100 K

Q.7. V_{rms} for Hydrogen at 27°C is V. Find V_{rms} for Hydrogen at 927 °C.

A. V

B. 2 V

C. 3 V

D. 4 V

Q.8. V_{rms} for Hydrogen at 27 ^{0}C is V. Find V_{rms} for oxygen at same temperature.

A. V/4

B. V/2

C. V

D. 3V

Q.9. V_{rms} for Hydrogen at certain temperature is 300 m/s. If temperature is doubled, Hydrogen dissociation into atomic H. Find new V_{rms}.

A. 400 m/s

B. 600 m/s

C. 500 m/s

D. 200 m/s

Q.10. At constant temperature, pressure of gas is doubled. Find change in V_{rms}.

A. doubled

B. tripled

C. halved

D. quadrupled

Q.11. Change in pressure is 2 % (at constant volume). Change in temperature is 5 °C. Calculate initial temperature and % change in V_{rms}.

Q.12. A gas is heated at constant pressure from T_1 to T_2 and then this gas is heated at constant volume from T_1 to T_2. Ratio of internal energies in both cases.

A. 1:2

B. 1:1

C. 1:3

D. 1:4

Q.13. A sample contains 2 mol Helium and 4 mol Hydrogen at 27°C. Find total energy of sample.

A. 7800 cal

B. 6800 cal

C. 5800 cal

D. 4800 cal

Q.14. $C_P - C_V = a$ for H_2

$C_P - C_V = b$ for O_2

If C_p and C_v are gram specific heat. Find relation between a and b.

A. a = 32 b

B. a = 16 b

C. a = 8b

D. a = 4b

Q.15. If $\gamma = (7/5)$, find C_v, C_p and F.

Q.16. If $R/C_v = 0.67$, find F

Q.17. 2 mol of He and 4 mol of H_2 are mixed. Find $(C_v)_{mix}$, $(C_p)_{mix}$ and $(\gamma)_{mix}$.

Q.18. During an experiment a gas follows an additional law VP^2 = constant. If volume of a gas becomes 4 times. Find effect on temperature.

A. becomes 2 times

B. becomes halved

C. becomes 3 times

D. remains same

Q.19. $P = [RT/(2V - b)] - [\frac{1}{4}(a/V^2)]$, find μ.

A. 1/2

B. 3/2

C. 5/2

D. 7/2