CHEMISTRY

BOOKS - V PUBLICATION

GAS LAWS AND MOLE CONCEPT

Question Bank

1. Examine the data given in the table (Temperature and number of molecules of the gas are kept constant).

a) Calculate P x V.

b) Which is the gas law related to this?

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2. Analyse the situations given belwo and explain the gas law associated with it: When an inflated baloon is immersed in water, its size decreases.

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3. Certain data regarding various gases kept under the same conditions of temperature and pressure are given below.

a) Complete the table.

b) which gas law is applicable here?

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4. a) Calculate the mass of 112 L CO_2 gas kept at STP (molecular mass = 44).

b) How many molecules of CO_2 are present in it?

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5. Calculate the volume of 170g of ammonia at STP? (Molecular mass 17).

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6. Find out the number of moles of molecules present in the samples given below. (GMM - N_2

= 28g, $H_2O = 18g$)

a) 56g N_2

b) $90gH_2O$

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7. The molecular mass of ammonia is 17.

a) How much is the GMM of ammonia?

b) Find out the number of moles of molecules present in 170g of ammonia.

c) Calculae the number of ammonia molecules present in the above sample of ammonia?

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8. How many grams of carbon and oxygen are required to get the same number of atoms as in one gram of Helium?

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9. Examine the samples given.

a) 20g He b) 44.8 L of NH_3 at STP

c) 67.2 L N_2 at STP d) 1 mole of H_2SO_4

e) 180g of water

i) Arrange the samples in the increasing order of the number of molecules in each.

ii) What will be the ascending order of the number of atoms?

iii) What will be the mass of samples b,c, and d?

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10. In 90 gram of water

a) How many molecules are present in it ?

b) What will be the total number of atoms?

c) What will be the total number of electrons in this sample?

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11. Number of atoms in 35.5g of chlorine.

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12. Find the relation and fill suitably.

12g carbon atom = 1 mole

36g carbon atom=.....

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13. The gram molecular mass of water is.....

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14. The volume of one mole of any gas at STP is

.....

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15. How many atoms are present in 1GAM nitrogen.

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16. The number of moles in 400g $CaCO_3$ .....

(Hint , Gram atomic mass ,

Ca = 40g, C = 12g, O = 16g)

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17. Substance which contains 6.022×10^{23} particles are called.....

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18. The energy of gas molecules are.....

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19. The bubbles arising from the bottom of an aquarium increases which gas law is related to

this?

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20. Find the number of moles of 44.8L gas at STP.

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21. Calculate the following with respect to 112L of CO_2 kept at STP.

a. Find out the number of moles in the given

volume.

b. Find out the mass of CO_2 in the given amount of gas.

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22. Which of the following has greater number of molecules?

1 litre of H_2 at STP

1 Litre of Cl_2 gas at STP

1 Lire water vapours at STP

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23. Analyse the given samples and answer the questions.

$a.\ NH_3$

b. $50gCaCO_3$

(N - 14, H - 1, Ca - 40, O - 16, C - 12)

i) Find the GMM of NH_3

ii) Find the number of atoms in sample b.

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24. Calculate the no. of molecules in 44.8L of oxygen at STP.

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25. Calculate the volume at STP

a. 5g Hydrogen moecules.

b. 35.5g chlorine molecules

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26. A definite mass of CO_2 gas at STP has a volume of 67.2 Litre in a cylinder.

a) Calculate the mass of CO_2 (Atomic mass, C - 12, O =16)

b) Calculate the number of molecules of CO_2 in the cylinder.

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27. Choose the correct statements related to gases.

a) distance between molecule is very high.

b) The freedom of movement of molecules is very low.

c) Attractive force between the molecules is very low.

d) The energy of molecules is very high.

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28. Write two situations which is related to Boyle's law.

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29. Complete the table given below.

(Hint : Atomic mass : H - 1, O - 16, Ca - 40, C - 12)

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30. Two gases of equal volume at STP is given below.

(Atomic mass S = 32, O = 16, N = 14)

a) Calculate the mass of the gas in B.

b) Find the number of molecules in A & B.

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31. NH_3, gas at STP is kept in a cylinder of volume 5600mL.

a) How many moles of NH_3, is present in the cylinder?

b) Calculate the mass of gas in the cyclinder.

c) Find the number of molecules in the gas

calculate the number of atoms in it. (Hint: Atomic mass, N=14, H-D)

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32. Arrange the following in the decreasing order of number of molecules.

a) 160g Oxygen gas

b) 67.2L NH_3, at STP.

c) 4GMM Nitrogen

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33. Choose the incorrect statement from the following.

a) 1 mole Hydrogen atom contains 6.022×10^{23} atoms.

b) 1 mole oxygen gas contains $2 \times 6.022 \times 10^{23}$ atoms.

c) Mass of 1 mole of chlorine is 35.5 g.

d) Mass of 0.5 mole of water is 18g.

e) 1 mole of nitrogen gas contains 22.4L volume at any state.

(Hint: Atomic mass H-1, 0-16, 1-35.5,N=14)

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34. 112L CO_2, and 88g CO_2, at STP is given

(Atomic mass C-12, 0-16, N-14, H-1)

a) Calculate the number of molecules in sample..

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35. Find the number of moles

a) 140g Nitrogen atom

b) 85g NH_3

c) $60.22 \times 10^{23} CO_2$, molecule.

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36. A cylinder filled with CO gas, at STP has volume of 11200L.

a) Calculate the no.of moles of CO in the cylinder?

b) Find the no.of atoms?

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37. Complete the table.

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38. Complete the table given below.

(Atomic mass=H - 1, Mg - 24, O - 16, C - 16)

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39. Find out the value of A,B,C (Hints: Atomic mass C-20, 0-16)

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40. Calculate the number of molecules present in the following substance

a) 90g water (H_2O)

b) 34g Ammonia (NH_3)

c) 5 mole Hydrogen (H_2)

d) 10 mole chlorine (Cl_2)

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41. Pick out the correct statements from the following. Also correct the incorrect statements.

a) The number of molecules present in 1 mol hydrogen and 1 mol oxygen are same.

b) 1 mole chlorine contain $4 \times 6.022 \times 10^{23}$ chlorine molecules.

c) The mass of 1/2 mol nitrogengas is 14g.

d) 0.5 mol water has the mass of 9g. There are $6.022 \times 10^{23} H_2O$ molecules in it.

(Atomic mass H= 1.0= 16, Cl 35.5, N = 14).

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42. One GAM substance contains Avogadro number of particles in it.

a) How many particles are there in Avogadro number?

b) Write the number of atoms present in each

of the following.

i) 32g Sulphur

ii) 32g Oxygen iii) 32g Carbon

Atomic mass S= 32, O=16, c=12

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43. a) Group the following into pairs having same number of atoms

A) 2g Hydrogen B) 16g oxygen

C) 14g nitrogen

D) 8g Helium

(Atomic mass H = 1,0 =16, N =14, He=4)

b) How many atoms are present in each pair

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44. Complete the table

Hint: (MM CO_2=44, CH, = 16, SO, = 64)

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45. Complete the table.

(Atomic mass N 14, H-1, S-32, O=16)

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46. Complete the word diagram.

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47. 4 samples of substance are given.

Hint: Molecidar mass, `NH_3 = 17, N_2 = 28, H_2 SO_4 - 98, O_2 - 32

a) Which of these samples have al number of molecules?

Which of these sample has least number of molecules?

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48. Calculate the number of moles of 11.2L chlorine at STP. Find its mass.

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49. No. of molecules in 32g 0_2 is 6.022×10^{23} .

This is number is known as.....

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50. Calculate the no. of moles in 220g CO_2

Hint: Atomic mass (C=12,0=16)

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51. Atomic mass of nitrogen is 14 which of these sample contains 6.022×10^{23} Nitrogen atoms?

(7g Nitrogen, 14g Nitrogen, 28gNitrogen, 1g Nitrogen)

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52. How many GAM is present in 32g oxygen.

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53. Find the relation and fill suitably

20g Helium: 5 mole

48g carbon :.....

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54. Calculae the no.of molecules in 2.8g Nitrogen.

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55. a) How many moles of Hydrogen and chlorine is present in 10 mole of Hydrogen chloride?

b) Calculate the mass of Hydrogen and chlorine in 10 mole?

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56. Find in the no. of molecules in the following substances.

a. 8g Helium

b. 4 mole Helium

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57. Which of the following statements are related to Boyle's law?

a. When pressure increases volume decreases.

b. When temperature increasen, volume

increases.

c. If P is pressure and V the volume N then $P \times V$ is a constant.

d. At constant temperature and pressure the volume of a gas is directly proportional to the number of molecules.

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58. 56g Nitrogen is taken

(Atomic mass: N=14)

a) Calculate the number of moles in it.

b) Find the number of molecuels.

c) How many atoms are present in it?

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59. Calculate the following.

a) How many GAM is present in 115g sodium??

b) Mass of 5 mole of calcium atom.

(Hint: GAM, Na = 23, Ca = 40g)

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60. GAM of carbon is 12g

a) How many atoms are present in 12g carbon?

b) Calculate the number of GAM's in 108g carbon.

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61. The volumes of some gases at STP is given below. Find the mass equivalent to the volume of gases.

(Atomic mass C-12, N-14, 0-16)

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62. a) Find the no.of moles of 112L NH_3 at STP

(Hint: Atomic mass-N 14, H=1

b) Calculate the no. of molecules in it

c) Calculate the mass of 112L, NH_3

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