CHEMISTRY

51. (3)

$C_2H_4 + 3O_2 \rightarrow 2CO_2 + 2H_2O$

$\because$ 28 gm C_2H_4 requires 96 gm oxygen

$\therefore$ 2.8×10^3 gm C_2H_4 requires $= \frac{96}{28}\times 2.8\times10^3 \text{gm} = 9.6\times10^3 \text{gm} = 9.6$ kg.

52. (1)

$\because$ 2.24 L of gas has mass = 4.4 gm

$\therefore$ 22.4 L of gas has mass

$= \frac{4.4}{2.24}\times 22.4 = 44$

So given gas is CO_2 because CO_2 has molecular mass = 44.

53. (1)

44g of CO_2 has $2\times6\times10^{23}$ atoms of oxygen

4.4g of CO_2 has $= \frac{12\times10^{23}}{44}\times 4.4$

$= 1.2\times10^{23}$ atoms.

54. (3)

According to Avogadro's hypothesis equal volumes of all gases under similar conditions of temperature and pressure contains equal number of molecules.

55. (4)

Amount of gold $= 19.7$ kg

$= 19.7\times1000$ gm $= 19700$ gm

Number of moles $= \frac{19700}{197} = 100$

$\therefore$ Number of atoms $= 100\times6.023\times10^{23}$

$= 6.023\times10^{25}$ atoms.

56. (1)

(1) 34 gm of water

$\because$ 18 gm H_2O $= 6.023\times10^{23}$ molecule

$\therefore$ 34 gm $H_2O = \frac{6.023\times10^{23}}{18}\times 34$

$= 11.37\times10^{23}$ molecules

(2) 28 gm of CO_2

$\because$ 44 gm $CO_2 = 6\times10^{23}$ molecules

$\therefore$ 28 gm CO_2

$= \frac{6\times10^{23}}{44}\times 28 = 3.8\times10^{23}$

(3) 46 gm of CH_3OH

$\because$ 32 gm $CH_3OH = 6\times10^{23}$ molecules

$\therefore$ 46 gm

$CH_3OH = \frac{6\times10^{23}}{32}\times 46 = 8.625\times10^{23}$

(4) $\because$ 108 gm of $N_2O_5 = 6\times10^{23}$ molecules

$\therefore$ 54 gm of $N_2O_5 = \frac{6\times10^{23}}{108}\times 54$

$= 3\times10^{23}$ molecules.

57. (1)

Urea- $NH_2 - CO - NH_2$

$\because$ 60 gm of urea contains 28 gm of nitrogen

$\therefore$ 100 gm of urea contains $\frac{28}{60}\times100 = 46.66$.

58. (3)

$N_1V_1 = N_2V_2 ; \frac{1}{2}\times200 = \frac{1}{10}\times V_2 ;$

$V_2 = 1000$ml

Volume of water added

$= 1000 - 200 = 800$ ml

59. (3)

$$4NH_{3(g)} + 5O_{2(g)} \rightarrow 4NO_{(g)} + 6H_2O_{(g)}$$

$t = 0$	1	1	0	0
$t = t$	$1-4x$	$1-5x$	$4x$	$6x$

Oxygen is limiting reagent

So, $X = \frac{1}{5} = 0.2$ all oxygen consumed

Left $NH_3 = 1 - 4\times0.2 = 0.2$.

60. (2)

$2Al + \frac{3}{2}O_2 \rightarrow Al_2O_3$

According to equation $\frac{3}{2}$ mole of O_2 combines with 2 mole Al.

2 mole Al = 54 gm