SBC

91 A compound contains equal masses of the elements A, B and C. If the atomic masses of A, B and C are 20, 40 and 60, respectively, the empirical formula of the compound is

(a) A_3B_2C
(b) AB_2C_3
(c) ABC
(d) $A_6B_3C_2$

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92 Acrylonitrile, C_3H_3N, is the starting material for the production of a kind of synthetic fibre (acrylics). It can be made from propylene, C_3H_6, by reaction with nitric oxide, NO.

$C_3H_6(g) + NO(g) \rightarrow C_3H_3N(g) + H_2O(g) + N_2(g)$ (Unbalanced)

How many grams acrylonitrile may be obtained from 420 kg of propylene and excess NO?

(a) 265 kg
(b) 530 kg
(c) 1060 kg
(d) 795 kg

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93 A quantity of 2.76 g of silver carbonate on being strongly heated yields a residue weighing (Ag = 108)

(a) 2.16 g
(b) 2.48 g
(c) 2.32 g
(d) 2.64 g

94 A 1.50 g sample of potassium bicarbonate having 80% purity is strongly heated. Assuming the impurity to be thermally stable, the loss in weight of the sample, on heating, is

(a) 3.72 g
(b) 0.72 g
(c) 0.372 g
(d) 0.186 g

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95. Two successive reactions, A → B and B → C, have yields of 90% and 80%, respectively. What is the overall percentage yield for conversion of A to C?

(a) 90% (b) 80%
(c) 72% (d) 85%

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96 Two isotopes of an element Q are Q^{97} (23.4% abundance) and Q^{94} (76.6% abundance). Q^{97} is 8.082 times heavier than C^{12} and Q^{94} is 7.833 times heavier than C^{12}. What is the average atomic weight of the element Q?

(a) 94.702 (b) 78.913
(c) 96.298 (d) 94.695

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97 A certain mixture of MnO and MnO_2 contains 66.67 mol per cent of MnO. What is the approximate mass per cent of Mn in it? (Mn = 55)

(a) 66.67
(b) 24.02
(c) 72.05
(d) 69.62

Q8 A sample of impure cuprous oxide contains 66.67% copper, by mass. What is the percentage of pure Cu_2O in the sample? (Cu = 63.5)

(a) 66.67 (b) 75
(c) 70 (d) 80

Q9 Diborane tetrachloride was treated with NaOH and the following reaction occurred:

$$B_2Cl_4 + NaOH \rightarrow NaBO_2 + H_2O + H_2 + NaCl$$

If 1362 ml of hydrogen gas is formed at STP, how much B_2Cl_4 was consumed? (B = 11)

(a) 9.97 g (b) 9.84 g
(c) 0.0968 g (d) 23.57 g

Q10 What total volume, in litre at 727°C and 1 atm, could be formed by the decomposition of 16 g of NH_4NO_3? Reaction: $2NH_4NO_3 \rightarrow 2N_2 + O_2 + 4H_2O(g)$.

(a) 57.47 l (b) 114.94 ml
(c) 41.78 l (d) 24.63 l

Q11 A sample of chalk contained as impurity a form of clay which losses 14.5% if its weight as water on strong heating. A 5 g of chalk sample, on heating, shows a loss in weight by 1.507 g. The mass percentage of $CaCO_3$ in the chalk sample is (Ca = 40)

9|2 An amount of 5 moles of A, 6 moles of B and excess amount of C are mixed to produce a final product D, according to the reactions:

$A + 2B \rightarrow I$

$I + C \rightarrow B + D$

What is the maximum moles of D, which can be produced assuming that the products formed can also be reused in the reactions?

(a) 3 moles
(b) 4.5 moles
(c) 5 moles
(d) 6 moles