

Multiple Choice

1) The mass (in g) of 4.8×10^{22} atom of mercury "Hg" is:

- A) 15 B) 16 C) 17 D) 18
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2) The number of sucrose " $C_{12}H_{22}O_{11}$ " sugar molecules that are present in 15.35 g of that sugar is:

- A) 4.2×10^{22} B) 3.5×10^{22} C) 2.7×10^{22} D) 2.2×10^{22}
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3) When 5.8 g of the hydrated cobalt sulfate " $CoSO_4 \cdot xH_2O$ " were heated until all of the " xH_2O " water of crystallization were driven off and 3.2 g of the anhydrous " $CoSO_4$ " were left over. Calculate the value "x".

- A) 4 B) 5 C) 6 D) 7
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4) An element "X" combines with oxygen "O" to form the oxide " X_2O_3 ". If 9.6 g of "O" combine with 23.6 g of that element, therefore the atomic mass (in a.m.u.) of "X" is:

- A) 59 B) 52 C) 48 D) 27
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5) An organic compound has the following composition by mass:
63.15% C, 5.3% H and 31.55% O.
Calculate the empirical formula of this compound.

- A) $C_3H_4O_3$ B) $C_4H_4O_3$ C) $C_8H_8O_3$ D) $C_5H_8O_3$
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6) Calculate the theoretical yield (in g) of aluminum "Al" that could be obtained from the reaction of 98.0 g of aluminum oxide " Al_2O_3 " with 50.0 g of charcoal "C" according to



- A) 46.5 B) 49.7 C) 50.2 D) 51.9
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7) Freon-12 gas " CCl_2F_2 " is manufactured from the reaction of carbon tetrachloride " CCl_4 " with antimony trifluoride " SbF_3 " according to:



If 146.0 kg of " SbF_3 " were allowed to react with an excess amount of " CCl_4 " where 117.0 kg of CCl_2F_2 were obtained. Calculate the percentage yield of CCl_2F_2 .

- A) 85% B) 83% C) 81 D) 79
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8) The unit of "mole fraction" is:

- A) mol^2 B) mol C) mol^{-1} D) has no unit
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9) The molarity "M" in $\text{mol}\cdot\text{L}^{-1}$ of an aqueous phosphoric acid solution (H_3PO_4) that contains 265.0 g of phosphoric acid in 800.0 ml of solution is:

- A) 3.88 B) 3.38 C) 2.87 D) 2.25
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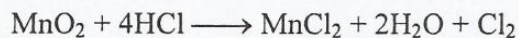
10) The volume of an ideal gas sample measured at S.T.P. is 8.3 L. What will be the volume (in L) of this gas sample if its temperature is raised to 30°C and its pressure is reduced to 500.0 torr.

- A) 16 B) 17 C) 15 D) 14
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11) The molar mass (in $\text{g}\cdot\text{mol}^{-1}$) of an ideal gas that 3.6 g of it occupy 1.0 L at 27°C and 1.2 atm pressure is:

- A) 65.7 B) 78.4 C) 73.9 D) 36.5
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12) Chlorine gas " Cl_2 " can be prepared by the reaction of manganese dioxide " MnO_2 " with concentrated hydrochloric acid " HCl " according to:



What is the mass (in g) of " MnO_2 " that would react with an excess amount of HCl to obtain 563 ml of Cl_2 gas at 25°C and 0.75 atm pressure.

- A) 1.25 B) 1.50 C) 1.75 D) 2.0
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