

- _____ 1) The molar mass of $\text{Ba}(\text{OH})_2$ is
A) 154.3 g B) 155.3 g
C) 171.3 g D) 308.6 g
- _____ 2) What is the gram-formula mass of $\text{Ca}_3(\text{PO}_4)_2$?
A) 248 g/mol B) 263 g/mol
C) 279 g/mol D) 310. g/mol
- _____ 3) One mole of O_2 has approximately the same mass as one mole of
A) CH_4 B) S C) LiH D) Cl_2
- _____ 4) Which sample contains a mole of atoms?
A) 23 g Na B) 24 g C
C) 42 g Kr D) 78 g K
- _____ 5) The total number of moles represented by 20 grams of CaCO_3 is
A) 1 B) 2 C) 0.1 D) 0.2
- _____ 6) What is the total mass in grams of 0.75 mole of SO_2 ?
A) 16 g B) 24 g C) 32 g D) 48 g
- _____ 7) In the compound Al_2O_3 , the ratio of aluminum to oxygen is
A) 2 grams of aluminum to 3 grams of oxygen
B) 3 grams of aluminum to 2 grams of oxygen
C) 2 moles of aluminum to 3 moles of oxygen
D) 3 moles of aluminum to 2 moles of oxygen
- _____ 8) What is the total number of moles of atoms present in 1 mole of $\text{Ca}_3(\text{PO}_4)_2$?
A) 13 B) 10 C) 8 D) 5
- _____ 9) What is the volume, in liters, of 576 grams of SO_2 gas at STP?
A) 101 B) 202 C) 216 D) 788
- _____ 10) What is the mass of 1.22×10^{23} molecules of nitrogen gas?
A) 2.84 g B) 5.67 g
C) 69.1 g D) 140.5 g
- _____ 11) What is the percent composition by mass of hydrogen in NH_4HCO_3 (gram-formula mass = 79 grams/mole)?
A) 5.1% B) 6.3%
C) 10.% D) 50.%
- _____ 12) What is the percent composition by mass of aluminum in $\text{Al}_2(\text{SO}_4)_3$ (gram-formula mass = 342 grams/mole)?
A) 7.89% B) 15.8%
C) 20.8% D) 36.0%
- _____ 13) What is the gram formula mass of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$?
A) 160. g B) 178 g
C) 186 g D) 250. g

14) The percent by mass of water in the hydrate $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ is closest to

- A) 18% B) 44% C) 56% D) 76%

15) A 10.0 gram sample of a hydrate was heated until all the water of hydration was driven off. The mass of anhydrous product remaining was 8.00 grams. What is the percent of water in the hydrate?

- A) 12.5% B) 20.0%
C) 25.0% D) 80.0%

16) A hydrate is a compound with water molecules incorporated into its crystal structure. In an experiment to find the percent by mass of water in a hydrated compound, the following data were recorded:

Mass of crucible + hydrated crystals before heating	7.50 grams
Mass of crucible	6.90 grams
Mass of crucible + anhydrous crystals after heating	7.20 grams

What is the percent by mass of water in the hydrate?

- A) 8.0 % B) 50. %
C) 72. % D) 96. %

17) What is the empirical formula of a compound that contains 30.4% nitrogen and 69.6% oxygen by mass?

- A) NO B) NO_2
C) N_2O_3 D) N_2O_5

18) What is the empirical formula of a compound consisting of 29.6% oxygen and 70.4% fluorine by mass?

- A) OF B) OF_2
C) O_2F D) O_2F_4

19) A substance has an empirical formula of CH_2 and a molar mass of 56 grams per mole. The molecular formula for this compound is

- A) CH_2 B) C_4H_6
C) C_4H_8 D) C_8H_4

20) A compound has an empirical formula of HCO_2 and a molecular mass of 90. grams per mole. What is the molecular formula of this compound?

- A) HCO B) $\text{H}_2\text{C}_2\text{O}_4$
C) $\text{H}_4\text{C}_4\text{O}_8$ D) $\text{H}_6\text{C}_6\text{O}_{12}$