

CH301 Worksheet 1 Answer Key: High School Chemistry Questions.

For each problem, identify the kind of question BEFORE answering it.

1. A 25 kg ball has a kinetic energy of 225 J. What is the speed of the ball?
What kind of question is this? energy
3 m/s
2. How many molecules of water are there in 100 mL of water? (The density of water = 1.000 g/mL.)
What kind of question is this? stoichiometry
 3.34×10^{24} molecules
3. Given that the atomic mass of carbon is given as 12.0107 g/mol, what are the approximate relative abundances of the two isotopes ^{12}C and ^{13}C ? *What kind of question is this? isotopes*
98.93% ^{12}C , 1.07% ^{13}C
4. In the electrolysis of $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$, how many atoms of O in O_2 are made from 4 g of H_2O ?
What kind of question is this? stoichiometry
 1.34×10^{23} molecules
5. What are the most likely ionic forms of (a) sodium and (b) calcium?
What kind of question is this? periodic trends
(a) Na^+ ; (b) Ca^{2+}
6. What is the product of a reaction between metallic lithium and oxygen, O_2 ?
What kind of question is this? oxidation numbers
 Li_2O
7. Name the following species: (a) Cl^- , (b) NO_3^- , (c) C_3H_8 . *What kind of question is this? naming*
(a) chloride; (b) nitrate; (c) propane
8. The combustion of ethanol has the following equation: $\text{C}_2\text{H}_5\text{OH} + 3 \text{O}_2 \rightarrow 2 \text{CO}_2 + 2 \text{H}_2\text{O}$
What mass of CO_2 is formed from 1 kg of ethanol? *What kind of question is this? stoichiometry*
1.913 kg
9. Vitamin K contains 78.95% C, 3.95% H, and 21.05% O by mass. What is its empirical formula?
What kind of question is this? empirical formula calculation
 $\text{C}_5\text{H}_5\text{O}$
10. Given that vitamin K (see question 9) has molecular weight of 158.15 g/mol, what is its molecular formula? *What kind of question is this? molecular formula calculation*
 $\text{C}_{10}\text{H}_{10}\text{O}_2$