

1. Silver Chloride is often a chemical used in silver plating. The compound itself only contains 75.27% of silver, Ag. Calculate the mass of silver chloride required to plate 200. mg of pure silver.

- (1) 0.201 g
- (2) 0.504 g
- (3) 0.433 g
- (4) 0.266 g
- (5) 0.101 g

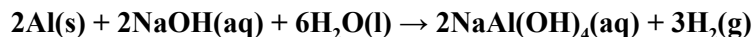
2. Find the percent mass composition of oxygen of sodium bicarbonate (baking soda).

- (1) 19.05%
- (2) 20.20%
- (3) 57.14%
- (4) 75.32%
- (5) 2.31%

3. You have a 68.42g sample of an unknown organic compound. After combustion analysis of your sample, you collect 196.26g of CO₂ and 26.76g of H₂O from the complete combustion of your sample. You know the molar mass of the compound is 416.43g/mol. Determine the molecular formula for the compound. How many carbons are in the molecular formula?

- (1) 4
- (2) 6
- (3) 8
- (4) 10
- (5) 12

4. One fun science experiment is to blow up balloons with hydrogen gas. Hydrogen gas can be made from mixing aluminum, sodium hydroxide, and water in the reaction below:



After combining 5.2g of aluminum with 6.1g of sodium hydroxide, about 0.35g of H₂ gas was collected. What is the percent yield of H₂ gas? (Water is in excess)

- (1) 76.6%
- (2) 33.4%
- (3) 20.3%
- (4) 94.3%
- (5) 55.2%

5. How many oxygen atoms are in a 40.3g sample of chlorous acid?

(1) 2.54×10^{23}

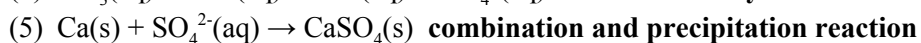
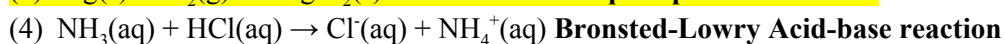
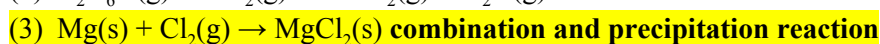
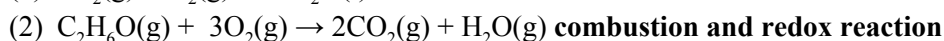
(2) 6.55×10^{23}

(3) 7.09×10^{23}

(4) 6.55×10^{24}

(5) 7.09×10^{24}

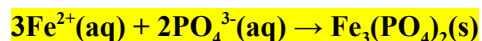
6. Which of these reactions is labeled incorrectly?



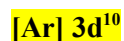
7. Which of these labeled names is correct?



8. Write out the balanced net ionic equation for iron (II) hydroxide reacting with potassium phosphate:



9. What is the electron configuration of copper(I)?



10. What neutral atom and singly-charged cation and anion all share the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6$?

Neutral atom: Ar

Cation: Na^+

Anion: Cl^-

11. Which answer has the element with the lower ionization energy listed first?

(1) S vs. Te

(2) F vs. Cl

(3) O vs. N

(4) Pb vs. Au

(5) S vs. Se

12. A recipe calls for a 47% m/m solution of isopropanol in acetone. You know your lab mates prefer to work with molarity so convert it for them.

(1) 5.40 M

(2) 6.33 M

(3) 6.16 M

(4) 5.30 M

(5) 4.00 M

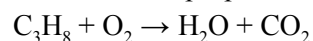
13. Predict the products and label which products are the conjugate acid and the conjugate base:



14. Calculate the number of molecules of Lactic Acid ($\text{CH}_3\text{CHOHCOOH}$) is in a 42.0g sample?

- (1) 4.03×10^{23}
- (2) 6.90×10^{23}
- (3) 9.01×10^{23}
- (4) 1.21×10^{23}
- (5) 2.81×10^{23}

15. Balance the combustion of propane below:



You run the reaction with 27g of propane with 1.3 moles of O_2 and get yield 14.2 g of water. What is the percent yield of water?

- (1) 65.32%
- (2) 75.85%
- (3) 20.1%
- (4) 20.99%
- (5) 67.43%

16. You perform a serial dilution with a solution of H_2SO_4 . In the first step, you dilute 30 mL of a 5.0 M H_2SO_4 solution by a certain volume to obtain a 0.150 M H_2SO_4 solution. In the second round you 10 mL of the 0.150 M H_2SO_4 solution and dilute it to a volume of 100 mL. What volume after the first dilution and what is the final concentration of the solution after the second dilution?

First volume: 1000mL or 1 L

Final concentration: 0.015 M