

14. What is the correct name for CuCl_2 ?
- a. copper chloride
b. dicopper chloride
c. **copper (II) chloride**
d. copper trichloride
15. What is the correct formula for the hydroxide ion?
- a. H^+
b. **OH^-**
c. OH^{+2}
d. H_2O^-
16. Which substance has polar covalent bonds?
- a. N_2
b. O_2
c. S_8
d. **NO_2**
17. According to Valence Shell Electron Pair Repulsion Theory (VSEPR), what geometric shape will NH_3 have?
- a. linear
b. bent
c. **trigonal pyramidal**
d. tetrahedral
18. Which of the following is not balanced?
- a. $2 \text{CO} + \text{O}_2 \rightarrow 2 \text{CO}_2$
b. **$2 \text{KNO}_3 + 10 \text{K} \rightarrow 5 \text{K}_2\text{O} + \text{N}_2$**
c. $2 \text{SO}_2 + \text{O}_2 \rightarrow 2 \text{SO}_3$
d. $2 \text{Al} + 3 \text{Cl}_2 \rightarrow 2 \text{AlCl}_3$
19. Balance the equation:

$$\text{AlCl}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{HCl}$$
 In the balanced equation, the coefficient of HCl is
- a. 2
b. 3
c. 4
d. **6**
20. What is the formula weight of SiH_4 ?
- a. 18 amu
b. **32 amu**
c. 36 amu
d. 60 amu
21. What mass of sulfur can be burned with 100 g of oxygen?
 The equation is: $\text{S} + \text{O}_2 \rightarrow \text{SO}_2$
- a. 32 g
b. 3.1 g
c. 31.3 g
d. **100 g**
22. How many moles are there in 880 g of CO_2 ?
- a. **20.0**
b. 40.0
c. 1.20×10^2
d. 5×10^{-2}
23. The burning of coal is exothermic because
- a. a flame is needed to start the reaction
b. energy is supplied to the reaction
c. **the reaction results in the release of heat**
d. the reaction absorbs energy
24. The addition of a catalyst to a reaction system
- a. increases the amount of heat evolved
b. increases the yield of product
c. decreases the amount of heat produced
d. **lowers the activation energy**
25. The minimum energy required to get a chemical reaction started is called:
- a. exothermic energy
b. **activation energy**
c. endothermic energy
d. rate of reaction

Problems:

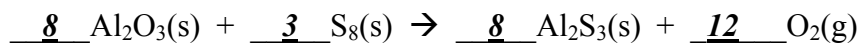
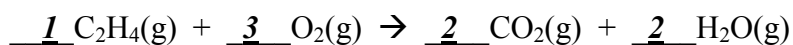
1. (10 points) Draw the Lewis structures for the following compounds:

CF ₄	BCl ₃	CH ₃ ⁻
$\begin{array}{c} \overline{\text{F}} \\ \\ \overline{\text{F}}-\text{C}-\overline{\text{F}} \\ \\ \overline{\text{F}} \end{array}$	$\begin{array}{c} \overline{\text{Cl}} \\ \\ \overline{\text{Cl}}-\text{B}-\overline{\text{Cl}} \end{array}$	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{H} \end{array}$

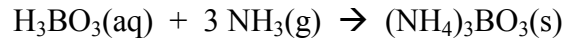
2. (5 points) Complete the table

Name	Formula
Iron(III) Chloride	<i>FeCl₃</i>
<i>Potassium Bromide</i>	KBr
Ammonium Iodide	<i>NH₄I</i>
<i>Sodium Nitrate</i>	NaNO ₃
Nitrogen Dioxide	<i>NO₂</i>

3 (5 points) Balance the following chemical equations



4. (5 points) Consider the following reaction:



How many grams of NH_3 are required to completely consume 31.5g of boric acid (H_3BO_3)?

$$\text{mol. wt. H}_3\text{BO}_3 = 61.84 \text{ g/mol}$$

$$\text{mol. wt. NH}_3 = 17.03 \text{ g/mol}$$

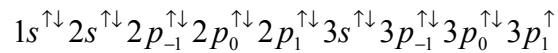
$$\begin{aligned} \text{moles H}_3\text{BO}_3 &= \frac{31.5\text{g}}{61.84\text{g/mol}} \\ &= 0.5095\text{mol} \end{aligned}$$

$$\begin{aligned} \frac{3\text{NH}_3}{1\text{H}_3\text{BO}_3} &= \frac{x}{0.5094\text{mol}} \\ x &= 1.528\text{mol NH}_3 \end{aligned}$$

$$\begin{aligned} \text{g NH}_3 &= 1.528\text{mol}(17.03\text{g/mol}) \\ &= 26.0\text{g} \end{aligned}$$

5. (5 points) Give the electron configuration for the following atoms:

Chlorine (Cl)



Sodium(Na)

