Stoichiometry Review Key

1. **A unit of measurement based on the number of atoms or molecules.**
2. **The molar mass of the atom or molecule.**
3. **Answers vary.**
4. **6.02×10^{23}; to calculate number of atoms or molecules.**
5. Calculate the molar mass of the following compounds:
    a. **153.88 g/mol**
    b. **275.15 g/mol**
    c. **285.73 g/mol**
    d. **97.57 g/mol**
    e. **342.15 g/mol**
    f. **139.31 g/mol**
6. Convert the following units into moles:
    a. **410.5 mol Fe^{+3} ions**
    b. **0.1387 mol OsO_4**
    c. **3.9833 mol CBr_4**
    d. **0.0178 mol NaOH**
7. Convert the following units into grams:
    a. **73.1 g CO_2**
    b. **213.4 g KIO_3**
    c. **2.65×10^7 g BF_3**
    d. **1.04 g $BeCr_2O_7$**
8. **Stoichiometry is the quantitative study of relationships between reactants and products in a chemical reaction.**
9. **The relationship between moles of one substances in a chemical reaction.**
10. **Without a balanced reaction the appropriate mole ratios may not be determined.**
11. **No relationship exists between the masses of reactants and products. Moles, however, are based on a number of particles. Explain this further.**
12. **Answers vary.**
13. Complete the table:

NH_4NO_3	N_2O	$2H_2O$
254 g	139 g	114 g
3.17 mol	3.17 mol	6.33 mol

14. How many moles are formed from 2.25 mol NH_4NO_3?
    a. **2.25 mol N_2O**
    b. **4.50 mol H_2O**
15. **0.26 mol O_2**
16. CFC-12 reaction:
    a. **$2HF + CCl_4 \rightarrow CCl_2F_2 + 2HCl$**
    b. **192 g CCl_4**
    c. **151 g CCl_2F_2**
17. $KClO_3$ reaction:
    a. **$2KClO_3 \rightarrow 3O_2 + 2KCl$**
    b. **21.7 g O_2**
    c. **20.1 g KCl**
18. **(actual)/(theoretical) x 100%**
19. **Define and describe these terms.**
20. **Answers vary.**
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22. **76.2%**
23. **The reactant that runs out first. This determines the extent of the reaction (how much product is made).**
24. Ammonia reaction:
    a. **$2 NH_3 + H_2SO_4 \rightarrow (NH_4)_2SO_4$**
    b. **H_2SO_4 is limiting reactant**
    c. **1.348×10^5 g; 134.8 kg $(NH_4)_2SO_4$**
    d. **65.3 kg NH_3 remaining**
    e. **72.94%**
25. **15.8 g NH_3 produced; 83.5 g N_2 remain**
26. **Sodium, because O_2 is allowed to react in excess. You have more oxygen than needed for the reaction.**
27. Lab data question:
    a. **$2Fe + 3S \rightarrow Fe_2S_3$**
    b. **Data Table:**
        i. **3.629 g Fe**
        ii. **3.891 g S**
        iii. **6.04 g Fe_2S_3**
    c. **Fe is the limiting reactant.**
    d. **6.752 g Fe_2S_3**
    e. **89.5%**
    f. **Answers vary.**