

3/5/18

The student will be able to:

- ① determine molar mass
- ② complete molar conversion problems
- ③ determine percent composition
- ④ determine empirical & molecular formulas.

Review: (Multiple choice is at the end)

| | | | |
|----------------|-------|-------------------------|-------|
| 16. Na | 23.00 | 17. Ba(OH) ₂ | |
| H | 1.01 | Ba | 137.3 |
| C | 12.01 | 2 O | 32.00 |
| O ₃ | 48.00 | 2 H | 2.02 |
| 84.02 g/mol | | 171.32 g/mol | |

18. given: 0.56 mol Fe need: _____ atoms

$$0.56 \text{ mol Fe} \times \frac{6.022 \times 10^{23} \text{ atoms}}{1 \text{ mol}} = 3.4 \times 10^{23} \text{ atoms}$$

19. given: 10.8 mol CaCO₃ need: _____ molecules

$$10.8 \text{ mol CaCO}_3 \times \frac{6.022 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = 6.50 \times 10^{24} \text{ molecules}$$

20. given: 7.21×10^{21} molecules Ag₂H₃O₂ need: _____ grams

molar mass: 166.95 g/mol

$$7.21 \times 10^{21} \text{ molecules Ag}_2\text{H}_3\text{O}_2 \times \frac{166.95 \text{ grams}}{6.022 \times 10^{23} \text{ molecules}} = 2.00 \text{ g Ag}_2\text{H}_3\text{O}_2$$

21. 0.8 mol H₂O × $\frac{6.022 \times 10^{23} \text{ molecule}}{1 \text{ mol}} \times \frac{3 \text{ atoms}}{1 \text{ molecule}} = 1.5 \times 10^{24} \text{ atoms H}_2\text{O}$

22. 35.8% Ne × $\frac{20.18 \text{ g}}{22.4 \text{ L}} = 32.3 \text{ g Ne}$

23. 8.42 g O₂ × $\frac{22.4 \text{ L}}{32.00 \text{ g}} = 5.89 \text{ L O}_2$

24. $\frac{2.232 \text{ g Fe}}{3.192 \text{ g}} \times 100 = \frac{0.912 \text{ g O}}{3.192 \text{ g}} \times 100 =$

| | |
|-----------|----------|
| 69.92% Fe | 30.08% O |
|-----------|----------|

25. 2 × 39.10 = 78.20
2 × 52.00 = 104.00
7 × 16.00 = 112.00

| |
|-----------|
| 26.58% K |
| 35.35% Cr |
| 38.07% O |

294.20 g/mol

$$26. \frac{92.26\%C}{12.01} \quad \frac{7.74\%H}{1.01}$$

$$\frac{7.68}{7.68} \quad \frac{7.66}{7.66}$$

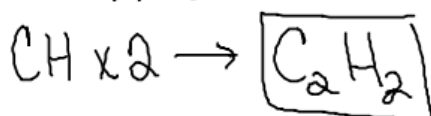
$$1 \quad 1$$

Empirical Formula = \boxed{CH}

Empirical Mass = 13.02 g/mol

27. Molecular Mass = 26.06 g/mol

$$26.06 / 13.02 = 2$$



molecular formula

$$28. \frac{40\%C}{12.01} \quad \frac{6.7\%H}{1.01} \quad \frac{53.3\%O}{16.00}$$

$$\frac{3.33}{3.33} \quad \frac{6.63}{3.33} \quad \frac{3.33}{3.33}$$

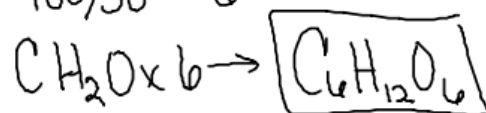
$$1 \quad 2 \quad 1$$

Empirical Formula = $\boxed{CH_2O}$

Empirical Mass = 30.03 g/mol

Molecular Mass = 180 g/mol

$$180 / 30 = 6$$



molecular formula

29. given = 3.0×10^{25} atoms need: ? mol

$$3.0 \times 10^{25} \text{ atoms} \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ atoms}} = \boxed{50. \text{ mol Au}}$$

30. given: 0.250g $C_7H_5NO_5S$ need: ? molecules

molar mass = 183.20g

$$0.250g \times \frac{6.022 \times 10^{23} \text{ molecules}}{183.20g} = \boxed{8.22 \times 10^{20} \text{ molecules}}$$

multiple choice

1. B

2. A

3. C

4. A

5. D

6. B

7. A

8. C

9. B

10. A

11. B

12. B

13. B

14. B

15. C