

PRACTICE PROBLEMS

1. Find the mass of 0.89 mol of CaCl_2 .

70 + 35

$$\frac{0.89 \text{ mol} \times 110 \text{ g CaCl}_2}{1 \text{ mol}}$$

2. A bottle of PbSO_4 contains 158.1 g of the compound. How many moles of PbSO_4 are in the bottle?

207 + 32 + 64

$$\frac{158.1 \text{ g}}{303 \text{ g PbSO}_4} \times 1 \text{ mol PbSO}_4$$

3. Find the mass of 1.112 mol of HF.

$$\frac{1.112 \text{ mol} \times 20 \text{ g HF}}{1 \text{ mol HF}}$$

4. Determine the number of moles of C_5H_{12} that are in 362.8 g of the compound.

12 x 5 + 12

$$\frac{362.8 \text{ g}}{72 \text{ g C}_5\text{H}_{12}} \times 1 \text{ mol C}_5\text{H}_{12}$$

5. Find the mass of 0.159 mol of SiO_2 .

28 + 32

$$\frac{0.159 \text{ mol} \times 60 \text{ g}}{1 \text{ mol}}$$

6. You are given 12.35 g of $\text{C}_4\text{H}_8\text{O}_2$. How many moles of the compound do you have?

4(12) + 8 + 32

$$\frac{12.35 \text{ g}}{88 \text{ g}} \times 1 \text{ mol}$$

7. Find the mass of 3.66 mol of N_2 .

$$\frac{3.66 \text{ mol} \times 28 \text{ g N}_2}{1 \text{ mol}}$$

8. A bottle of KMnO_4 contains 66.38 g of the compound. How many moles of KMnO_4 does it contain?

40 + 55 + 64

$$\frac{66.38 \text{ g}}{159 \text{ g}} \times 1 \text{ mol}$$

9. Determine the number of atoms that are in 0.58 mol of Se.

$$\frac{0.58 \times 6.02 \times 10^{23}}{1} =$$

10. How many moles of barium nitrate (BaNO_3) contain 6.80×10^{24} formula units??

$$\frac{6.80 \times 10^{24}}{6.02 \times 10^{23}} =$$

11. Determine the number of atoms that are in 1.25 mol of O_2 .

$$\frac{1.25 \text{ mol} \times 6.02 \times 10^{23}}{1 \text{ mol}} =$$

12. How many moles of magnesium bromide (MgBr_2) contain 5.38×10^{24} formula units?

$$\frac{5.38 \times 10^{24}}{6.02 \times 10^{23}} \times 1 \text{ mol} =$$

13. Determine the number of formula units that are in 0.688 mol of AgNO_3 .

$$\frac{0.688 \times 6.02 \times 10^{23}}{1} =$$

14. How many moles of ethane (C_2H_6) contain 8.46×10^{24} formula units?

$$\frac{8.46 \times 10^{24}}{6.02 \times 10^{23}} \times 1 \text{ mol} =$$

15. Determine the number of formula units that are in 1.48 mol of NaF.

$$\frac{1.48 \text{ mol} \times 6.02 \times 10^{23}}{1} =$$

16. How many formula units are in 3.5 g of NaOH.

23 + 16 + 1

$$\frac{3.5 \text{ g}}{40 \text{ g}} \times \frac{6.02 \times 10^{23}}{1 \text{ mol}} =$$

Name: _____

Date: _____

Period: _____

PRACTICE PROBLEMS – CONTINUED

17. If you burned 6.10×10^{24} molecules of ethane (C_2H_6), what mass of ethane did you burn?

 $12(2) + 6$

$$\frac{6.10 \times 10^{24}}{6.02 \times 10^{23}} \times \frac{1 \text{ mol}}{1 \text{ mol}} \times \frac{30 \text{ g}}{1 \text{ mol}} =$$

18. How many formula units are in 5.1 g of TiO_2 ?

 $48 + 32$

$$\frac{5.1 \text{ g}}{80 \text{ g}} \times \frac{1 \text{ mol}}{1 \text{ mol}} \times \frac{6.02 \times 10^{23}}{1 \text{ mol}} =$$

19. What is the mass of 3.62×10^{24} molecules of methanol (CH_3OH)?

 $12 + 4 + 16$

$$\frac{3.62 \times 10^{24}}{6.02 \times 10^{23}} \times \frac{1 \text{ mol}}{1 \text{ mol}} \times \frac{32 \text{ g}}{1 \text{ mol}} =$$

20. How many formula units are in 1.4 g of $PbCl_2$?

$$\frac{1.4 \text{ g}}{277 \text{ g}} \times \frac{1 \text{ mol}}{1 \text{ mol}} \times \frac{6.02 \times 10^{23}}{1 \text{ mol}} =$$

 $207 + 70$

21. Determine the mass of 2.94×10^{24} molecules of decane ($C_{10}H_{22}$).

$$\frac{2.94 \times 10^{24}}{6.02 \times 10^{23}} \times \frac{1 \text{ mol}}{1 \text{ mol}} \times \frac{142 \text{ g}}{1 \text{ mol}} =$$

 $12(10) + 22$

22. How many formula units are in 5.6 g of H_2S ?

$$\frac{5.6 \text{ g}}{34 \text{ g}} \times \frac{1 \text{ mol}}{1 \text{ mol}} \times \frac{6.02 \times 10^{23}}{1 \text{ mol}} =$$

 $32 + 2$

23. A container with a volume of 893 L contains how many moles of air at STP?

$$\frac{893 \text{ L}}{22.4 \text{ L}} \times \frac{1 \text{ mol}}{1 \text{ mol}} =$$

24. A chemical reaction produces 0.37 mol of N_2 gas. What volume will that gas occupy at STP?

$$0.37 \text{ mol} \times \frac{22.4 \text{ L}}{1 \text{ mol}} =$$

25. A canister with a volume of 694 L contains how many moles of oxygen at STP.

$$\frac{694 \text{ L}}{22.4 \text{ L}} \times \frac{1 \text{ mol}}{1 \text{ mol}} =$$

26. A chemical reaction produces 13.8 mol of CO gas. What volume will that gas occupy at STP?

$$13.8 \text{ mol} \times \frac{22.4 \text{ L}}{1 \text{ mol}} =$$

27. A tube with a volume of 3.68 L contains how many moles of neon gas at STP?

$$\frac{3.68 \text{ L}}{22.4 \text{ L}} \times \frac{1 \text{ mol}}{1 \text{ mol}} =$$

28. A chemical reaction produces 0.884 mol of H_2S gas. What volume will that gas occupy at STP?

$$0.884 \text{ mol} \times \frac{22.4 \text{ L}}{1 \text{ mol}} =$$

29. A container with a volume of 101 L contains how many moles of argon gas at STP?

$$\frac{101 \text{ L}}{22.4 \text{ L}} \times \frac{1 \text{ mol}}{1 \text{ mol}} =$$

30. A chemical reaction produces 138 mol of HBr gas. What volume will that gas occupy at STP?

$$138 \text{ mol} \times \frac{22.4 \text{ L}}{1 \text{ mol}} =$$