Date_____Name_____ Per_____

Mole Conversion Problems

Complete the following practice problems for mole conversion. Show your work and units!

1. How many moles are in 72.9 g of HCl? Molar mass HCl = 36.46 $\frac{g}{mol}$

$\frac{72.9g}{36.46\frac{g}{mol}}$ = 1.999 mol

2. How many moles are in 79.85 g Fe_2O_3? Molar mass = 159.7$\frac{g}{mol}$

$\frac{79.85g}{159.7\frac{g}{mol}}$ = 0.5 mol

3. How many molecules are in 720 g of $C_6H_{12}O_6$? Molar mass = 180.18$\frac{g}{mol}$

$\frac{720g}{180.18\frac{g}{mol}}$ = 3.996 mol

3.996 mol x ($6.02 \times 10^{23} \frac{particles}{mol}$) = 2.406×10^{24} particles

4. How many grams are in 3.5 mol of $Ca_3(PO_4)_2$? Molar mass = 310.18 $\frac{g}{mol}$

310.18 $\frac{g}{mol}$ x 3.5 mol = 1085.63 g

5. How many molecules are in 8550g of SO_2? Molar mass = 64.07 $\frac{g}{mol}$

$\frac{8550g}{64.07\frac{g}{mol}}$ = 133.45 mol

133.45 mol x ($6.02 \times 10^{23} \frac{particles}{mol}$) = 8.03×10^{25} particles

6. How many grams are in 3.01×10^{24} molecules of $(NH_4)_2SO_4$? Molar mass = 132.17$\frac{g}{mol}$

$\frac{3.01\times 10^{24} \text{ particles}}{6.02 \times 10^{23} \frac{particles}{mol}}$ = 5 mol

5 mol x 132.17$\frac{g}{mol}$ = 660.85 g

7. How many molecules are in 85 g of $AgNO_3$? Molar mass = 169.88$\frac{g}{mol}$

$\frac{85g}{169.88\frac{g}{mol}}$ = 0.5 mol

0.5 mol x ($6.02 \times 10^{23} \frac{particles}{mol}$) = 3.01×10^{23}

8. How many grams are in 1.204×10^{24} molecules of CH_3COOH? Molar mass = 60.06$\frac{g}{mol}$

$\frac{1.204 \times 10^{24} \text{ particles}}{6.02 \times 10^{23} \frac{particles}{mol}}$ = 2.0 mol

2.0 mol x 60.06$\frac{g}{mol}$ = 120.12 g

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9. Convert 86.84 g of LiBr to moles: Molar mass = 86.84 $\frac{g}{mol}$

$\frac{86.84\ g}{86.84\ \frac{g}{mol}}$ = 1.0 mol

10. Convert 8.045 g of H_2CO_3 to moles: Molar mass = 62.03 $\frac{g}{mol}$

$\frac{8.045\ g}{62.03\ \frac{g}{mol}}$ = 0.1297 mol

11. How many grams of lithium are there in 3.45 moles? Molar mass = 6.94 $\frac{g}{mol}$

6.94 $\frac{g}{mol}$ x 3.45 mol = 23.943 g

12. How many moles of nitrogen are there in 4.3×10^{23} molecules?

$\frac{4.3 \times 10^{23}\ particles}{6.02 \times 10^{23}\ \frac{particles}{mol}}$ = .714 mol

13. How many cadmium atoms are there in 6.57×10^{3} moles?

6.57×10^{3} moles x $(6.02 \times 10^{23}\ \frac{particles}{mol})$ = 3.955×10^{27} particles

14. How many grams of SO_2 are 4.5×10^{24} molecules? Molar mass = 64.07 $\frac{g}{mol}$

$\frac{4.5 \times 10^{24}\ particles}{6.02 \times 10^{23}\ \frac{particles}{mol}}$ = 7.475 mol

7.475 mol x 64.07 $\frac{g}{mol}$ = 478.93 g

15. How many copper atoms are in 5.6 mole of Cu_2O_3?

5.6 mol x $(6.02 \times 10^{23}\ \frac{particles}{mol})$ = 3.37×10^{24} particles

16. How many grams of sulfur are in 3.45×10^{22} molecules of SO_2? Molar mass Sulfur = 32.07 $\frac{g}{mol}$

$\frac{3.45 \times 10^{22}\ particles}{6.02 \times 10^{23}\ \frac{particles}{mol}}$ = 0.0573 mol

0.0573 mol x 32.07 $\frac{g}{mol}$ = 1.838 g