

Name \_\_\_\_\_

## Mole Conversions

Determine the molar mass of each of the following substances:

- |                      |                    |  |                    |
|----------------------|--------------------|--|--------------------|
| 1) S                 | <u>32.06g/mol</u>  | 5) CaCl <sub>2</sub>                             | <u>110.98g/mol</u> |
| 2) H <sub>2</sub> O  | <u>18.02g/mol</u>  | 6) Mg(NO <sub>3</sub> ) <sub>2</sub>             | <u>148.33g/mol</u> |
| 3) CO <sub>2</sub>   | <u>44.01g/mol</u>  | 7) C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> | <u>180.18g/mol</u> |
| 4) KMnO <sub>4</sub> | <u>158.04g/mol</u> | 8) CuSO <sub>4</sub> ·5H <sub>2</sub> O          | <u>249.61g/mol</u> |

Complete the following mole conversions:

- 9) What is the mass of 2.31 moles of iron metal? 129g Fe
- 10) How many moles of NaCl is in a salt shaker if the mass of NaCl is 25.2g? 0.431moles NaCl
- 11) What is the volume of 3.82 moles of methane gas (CH<sub>4</sub>) at STP? 85.6L CH<sub>4</sub>
- 12) 6.23L of O<sub>2</sub> gas is how many moles at STP? 0.278moles O<sub>2</sub>
- 13) How many atoms are in 0.0045 moles of copper? 2.7x10<sup>21</sup>atoms Cu
- 14) How many molecules are in 5.82 moles of water? 3.50x10<sup>24</sup>molecules H<sub>2</sub>O
- 15) How many atoms are in 5.82 moles of water? 1.05x10<sup>25</sup> total atoms
- 16) What is the mass of 2.85x10<sup>22</sup> molecules of CO<sub>2</sub>? 2.08g CO<sub>2</sub>
- 17) How many atoms are in 9.15x10<sup>-4</sup>g of silver? 5.11x10<sup>18</sup>atoms Ag
- 18) How many molecules are in 1.76L of chlorine gas at STP? 4.73x10<sup>22</sup>molecules Cl<sub>2</sub>

Are you ready?

- 19) A chemical reaction creates 0.329 moles of hydrogen gas. How many atoms of hydrogen were created?  
3.96x10<sup>23</sup>atoms H
- 20) A student wishes to use 3.42x10<sup>25</sup> molecules of propane gas (C<sub>3</sub>H<sub>8</sub>), how many liters of gas should be used at STP?  
1270L C<sub>3</sub>H<sub>8</sub>
- 21) How many atoms of carbon will be involved in the reaction if 6.27grams of glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) is used?  
1.26x10<sup>23</sup>atoms C
- 22) How many iron atoms are present in a cylinder that has a radius of 2cm and a length (height) of 10 cm if the density of iron is 7.6g/cm<sup>3</sup>?  $V_{\text{cyl}} = \pi r^2 h$   
1.03x10<sup>25</sup>atoms Fe
- 23) What would the radius of a helium balloon be if it contained 3.47x10<sup>20</sup> atoms of helium at STP?  
 $V = 4/3\pi r^3$   
1.46cm
- 24) A sample of ammonium phosphate contains 9.20x10<sup>22</sup> atoms. How many grams is in the sample?  
1.14g (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub>
- 25) A sample of CH<sub>4</sub> has a volume of 7.63L at STP. What is the density of the sample? 0.717g/L