

Name _____

Mole Conversions

Determine the molar mass of each of the following substances:

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|-------------------------|--|
| 1) S | 5) CaCl_2 |
| 2) H_2O | 6) $\text{Mg}(\text{NO}_3)_2$ |
| 3) CO_2 | 7) $\text{C}_6\text{H}_{12}\text{O}_6$ |
| 4) KMnO_4 | 8) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ |

Complete the following mole conversions:

- 9) What is the mass of 2.31 moles of iron metal?
- 10) How many moles of NaCl is in a salt shaker if the mass of NaCl is 25.2g?
- 11) What is the volume of 3.82 moles of methane gas (CH_4) at STP?
- 12) 6.23L of O_2 gas is how many moles at STP?
- 13) How many atoms are in 0.0045 moles of copper?
- 14) How many molecules are in 5.82 moles of water?
- 15) How many atoms are in 5.82 moles of water?
- 16) What is the mass of 2.85×10^{22} molecules of CO_2 ?
- 17) How many atoms are in 9.15×10^{-4} g of silver?
- 18) How many molecules are in 1.76L of chlorine gas at STP?

Are you ready?

- 19) A chemical reaction creates 0.329 moles of hydrogen gas. How many atoms of hydrogen were created?
- 20) A student wishes to use 3.42×10^{25} molecules of propane gas (C_3H_8), how many liters of gas should be used at STP?
- 21) How many atoms of carbon will be involved in the reaction if 6.27grams of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) is used?
- 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 $7.6\text{g}/\text{cm}^3$? $V_{\text{cyl}} = \pi r^2 h$
- 23) What would the radius of a helium balloon be if it contained 3.47×10^{20} atoms of helium at STP?
 $V = 4/3\pi r^3$
- 24) A sample of ammonium phosphate contains 9.20×10^{22} atoms. How many grams is in the sample?
- 25) A sample of CH_4 has a volume of 7.63L at STP. What is the density of the sample?