

### Molar Conversions Worksheet

- How many moles does 20.0 grams of  $\text{H}_2\text{O}$  represent?  $\frac{20.0 \text{ g}}{18.0 \text{ g/mol}} = 1.11 \text{ mol}$
- How many moles does 22.0 grams of  $\text{CO}_2$  represent?  $\frac{22.0 \text{ g}}{44.0 \text{ g/mol}} = 0.500 \text{ mol}$
- What is the mass of 3.0 moles of  $\text{Ba}(\text{OH})_2$ ?  $3.0 \text{ mol} \times (2 \times 137.3 + 2 \times 16.0) = 9728.6 \text{ g}$
- What is the mass of 3.0 moles of water?  $3.0 \text{ mol} \times (2 \times 1.0 + 16.0) = 54.0 \text{ g}$
- How many molecules are in 0.01 moles of  $\text{H}_2\text{O}$ ?  $0.01 \text{ mol} \times (6.02 \times 10^{23}) = 6.02 \times 10^{21}$
- How many molecules are in 0.001 moles of  $\text{H}_2\text{O}$ ?  $0.001 \text{ mol} \times (6.02 \times 10^{23}) = 6.02 \times 10^{20}$
- Convert 100 g  $\text{H}_2\text{O}$  molecules to  $\text{H}_2$ ,  $\text{O}_2$  moles.  $\frac{100 \text{ g} \times (2 \times 1.0)}{18.0 \text{ g/mol}} = 11.1 \text{ mol}$
- How many moles of glucose does 1.0 g  $\text{H}_2\text{O}$  molecules represent?  $\frac{1.0 \text{ g} \times (2 \times 1.0)}{18.0 \text{ g/mol}} = 0.11 \text{ mol}$
- What would be the mass of 1.00 g  $\text{H}_2\text{O}$  molecules of water?  $\frac{1.0 \text{ g} \times (2 \times 1.0)}{18.0 \text{ g/mol}} \times 18.0 \text{ g/mol} = 1.00 \text{ g}$
- How much mass does 1.00 g  $\text{H}_2\text{O}$  mass of water represent?  $\frac{1.0 \text{ g} \times (2 \times 1.0)}{18.0 \text{ g/mol}} \times 18.0 \text{ g/mol} = 1.00 \text{ g}$
- How many molecules does 10.0 grams of water represent?  $10.0 \text{ g} \times \frac{6.02 \times 10^{23}}{18.0 \text{ g/mol}} = 3.34 \times 10^{23}$
- How many grams does 1.0 grams of sodium represent?  $1.0 \text{ g} \times \frac{6.02 \times 10^{23}}{23.0 \text{ g/mol}} = 2.62 \times 10^{22}$
- What would be the volume of 0.20 moles of chlorine gas at STP?  $0.20 \text{ mol} \times (22.4 \text{ L}) = 4.48 \text{ L}$
- What would be the volume of 0.20 moles of helium gas at STP?  $0.20 \text{ mol} \times (22.4 \text{ L}) = 4.48 \text{ L}$
- How many moles does 10.0 L of Hydrogen gas at STP represent?  $\frac{10.0 \text{ L}}{22.4 \text{ L/mol}} = 0.446 \text{ mol}$
- A sample of Oxygen gas occupies 1.0 L at STP. How many molecules does represent?  $\frac{1.0 \text{ L} \times 6.02 \times 10^{23}}{22.4 \text{ L/mol}} = 2.69 \times 10^{22}$