## Stoichiometry

Use your knowledge of stoichiometry to answer the following questions. You must show work to receive credit!

Use the following equation for questions 1-3. Make sure to balance the equation before attempting to solve the problems that follow.

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\mathrm{CO}_{2}+\mathrm{H}_{2} \mathrm{O} \longrightarrow \mathrm{C}_{12} \mathrm{H}_{22} \mathrm{O}_{11}+\mathrm{O}_{2}
$$

1. How many grams of sucrose $\left(\mathrm{C}_{12} \mathrm{H}_{22} \mathrm{O}_{11}\right)$ is produced from 224 L of carbon dioxide at STP?
2. How many liters of carbon dioxide at STP are needed to produce 50.0 g of sucrose $\left(\mathrm{C}_{12} \mathrm{H}_{22} \mathrm{O}_{11}\right)$ ?
3. What mass of water would be needed to combine with 200.0 L of carbon dioxide (at STP)?

Use the following equation for questions 4-6. Make sure to balance the equation before attempting to solve the problems that follow.
$\mathrm{CO}+\mathrm{Fe}_{2} \mathrm{O}_{3} \longrightarrow \mathrm{Fe}+\mathrm{CO}_{2}$
4. What mass of iron (III) oxide will react with 50.0 L of carbon monoxide at STP?
5. What volume of carbon dioxide at STP is produced form $1.00 \times 10^{3} \mathrm{~g}$ of iron (III) oxide?
6. What mass of iron is produced when 0.300 L carbon dioxide is produced at STP?

Use the following equation for questions 7-9. Make sure to balance the equation before attempting to solve the problems that follow.
$\mathrm{NaHCO}_{3}+\mathrm{H}_{2} \mathrm{SO}_{4} \longrightarrow \mathrm{Na}_{2} \mathrm{SO}_{4}+\mathrm{CO}_{2}+\mathrm{H}_{2} \mathrm{O}$
7. How many grams of sodium sulfate is produced from $2.40 \times 10^{24}$ formula units of sodium bicarbonate, assuming there is plenty of sulfuric acid $\left(\mathrm{H}_{2} \mathrm{SO}_{4}\right)$ ?
8. How many liters of carbon dioxide at STP would be produced form $2.40 \times 10^{24}$ formula units of sodium bicarbonate? Assume there is excess sulfuric acid $\left(\mathrm{H}_{2} \mathrm{SO}_{4}\right)$.
9. How many formula units of sulfuric acid $\left(\mathrm{H}_{2} \mathrm{SO}_{4}\right)$ would be used when $250.0 \mathrm{~L} \mathrm{CO}_{2}$ is produced at STP?

