



Directions: Show all work for full credit. Use dimensional analysis set-up, label all units. All answers must show correct significant figures and proper scientific notation.

1. What is the volume at STP of 0.960 mol of  $\text{CO}_2$ ?

1. \_\_\_\_\_

2. Assuming STP, how many moles are in 67.2 L  $\text{SO}_2$ ?

2. \_\_\_\_\_

3. 289 grams of  $\text{H}_2\text{S}$  gas was accidentally released from an oil well. How many liters of gas escaped from the well?

3. \_\_\_\_\_

4. How many molecules are in 11.2 liter container of  $\text{NO}_2$  gas at STP?

4. \_\_\_\_\_

5. How many oxygen atoms are in the container in the previous question?

5. \_\_\_\_\_

6. In a container of ethane gas ( $C_2H_6$ ) there are  $4.6 \times 10^{24}$  atoms of carbon. What is the volume of this container at standard temperature and pressure?

6. \_\_\_\_\_

7. What is the density of 1 mol of nitrogen ( $N_2$ ) at STP? *Remember: density = mass/volume*

7. \_\_\_\_\_

8. What is the density of 2 mol of helium (He) at STP?

8. \_\_\_\_\_

9. What is the gas that has a density of 0.902 g/L at STP?

9. \_\_\_\_\_

10. Which gas below has a density of 3.17 g/L at STP?  
 $NO_3$ ,  $H_2S$ ,  $H_2O$ ,  $Cl_2$ ,  $NH_3$

10. \_\_\_\_\_





**Answers:**

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- |   |    |                              |
|---|----|------------------------------|
| 1) $2.15 \times 10^1 \text{ L CO}_2$            | Or | $21.5 \text{ L CO}_2$        |
| 2) $3.00 \times 10^0 \text{ mol SO}_2$          | Or | $3.00 \text{ mol SO}_2$      |
| 3) $1.90 \times 10^2 \text{ L H}_2\text{S}$     | Or | $190 \text{ L H}_2\text{S}$  |
| 4) $3.01 \times 10^{23} \text{ molecules NO}_2$ |    |                              |
| 5) $6.02 \times 10^{23} \text{ atoms O}$        |    |                              |
| 6) $8.6 \times 10^1 \text{ L C}_2\text{H}_6$    | Or | $86 \text{ L C}_2\text{H}_6$ |
| 7) $1.25 \text{ g/L}$                           |    |                              |
| 8) $2 \times 10^{-1} \text{ g/L}$               | Or | $0.2 \text{ g/L}$            |
| 9) $\text{Cl}_2$                                |    |                              |