

ANSWER KEY

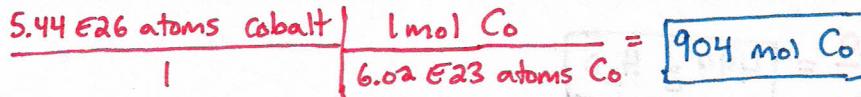
EXTRA PRACTICE: 2-Step Mole Conversions

Name: _____

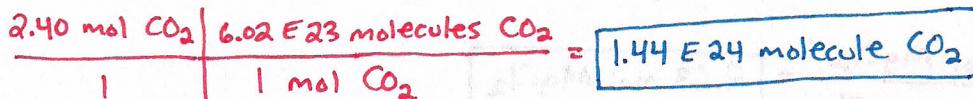
Solve the following mole conversion problems. Be sure to show your work & include correct units.

Part I: Particles \leftrightarrow Mole

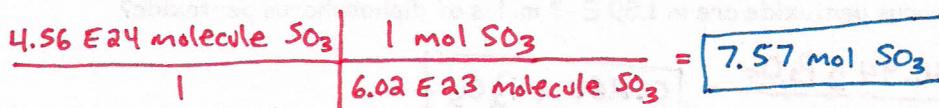
1. How many moles of cobalt are present in 5.44×10^{26} atoms of cobalt?



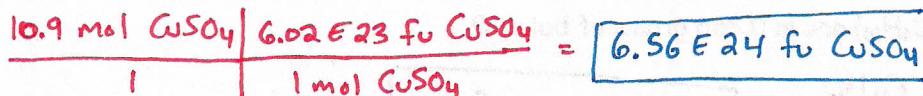
2. How many molecules of carbon dioxide are in 2.40 moles of carbon dioxide?



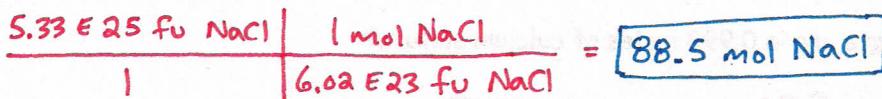
3. How many moles of sulfur trioxide are in 4.56×10^{24} molecules of sulfur trioxide?



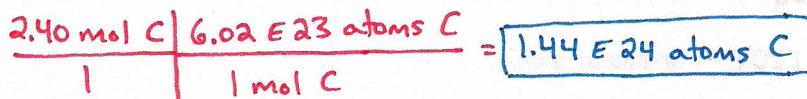
4. How many formula units (f.u.) are in 10.9 moles of copper (II) sulfate?



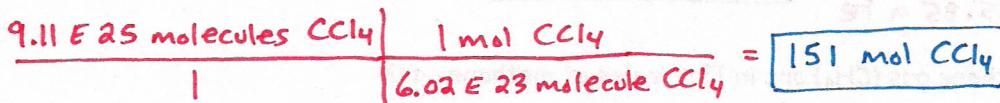
5. How many moles of sodium chloride are in 5.33×10^{25} formula units (f.u.) of sodium chloride?



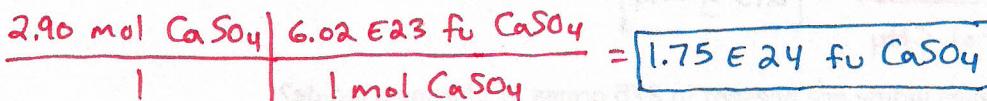
6. How many atoms of carbon are present in 2.40 moles of carbon?



7. How many moles of carbon tetrachloride are in 9.11×10^{25} molecules of carbon tetrachloride?



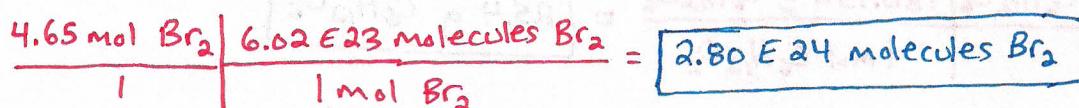
8. How many formula units (f.u.) of calcium sulfate are in 2.90 moles of calcium sulfate?



9. How many moles of potassium fluoride are in 5.55×10^{24} formula units (f.u.) of potassium fluoride?



10. How many molecules of bromine are in 4.65 moles of bromine?



Part II: Mass \leftrightarrow Mole

11. How many moles of water are present in 100. grams of water?

$$\frac{100 \text{ g H}_2\text{O}}{1} \left| \begin{array}{c} 1 \text{ mol H}_2\text{O} \\ 18.016 \text{ g H}_2\text{O} \end{array} \right| = \boxed{5.55 \text{ mol H}_2\text{O}}$$

12. How many grams of water are in 27.7 moles of water?

$$\frac{27.7 \text{ mol H}_2\text{O}}{1} \left| \begin{array}{c} 18.016 \text{ g H}_2\text{O} \\ 1 \text{ mol H}_2\text{O} \end{array} \right| = \boxed{499 \text{ g H}_2\text{O}}$$

13. How many moles of magnesium chloride are in 250. grams of magnesium chloride?

$$\frac{250 \text{ g MgCl}_2}{1} \left| \begin{array}{c} 1 \text{ mol MgCl}_2 \\ 95.21 \text{ g MgCl}_2 \end{array} \right| = \boxed{2.63 \text{ mol MgCl}_2}$$

14. How many grams of diphosphorus pentoxide are in 1.89×10^{-3} moles of diphosphorus pentoxide?

$$\frac{1.89 \times 10^{-3} \text{ mol P}_2\text{O}_5}{1} \left| \begin{array}{c} 141.94 \text{ g P}_2\text{O}_5 \\ 1 \text{ mol P}_2\text{O}_5 \end{array} \right| = \boxed{0.268 \text{ g P}_2\text{O}_5}$$

15. How many moles of butane (C_4H_{10}) are in 0.266 grams of butane?

$$\frac{0.266 \text{ g C}_4\text{H}_{10}}{1} \left| \begin{array}{c} 1 \text{ mol C}_4\text{H}_{10} \\ 58.12 \text{ g C}_4\text{H}_{10} \end{array} \right| = \boxed{0.00458 \text{ mol C}_4\text{H}_{10}}$$

16. How many grams of calcium sulfate are in 0.993 moles of calcium sulfate?

$$\frac{0.993 \text{ mol CaSO}_4}{1} \left| \begin{array}{c} 136.14 \text{ g CaSO}_4 \\ 1 \text{ mol CaSO}_4 \end{array} \right| = \boxed{135 \text{ g CaSO}_4}$$

17. How many moles of iron are present in 1.20×10^{-4} grams of iron?

$$\frac{1.20 \times 10^{-4} \text{ g Fe}}{1} \left| \begin{array}{c} 1 \text{ mol Fe} \\ 55.85 \text{ g Fe} \end{array} \right| = \boxed{2.15 \times 10^{-6} \text{ mol Fe}}$$

18. How many grams of methane gas (CH_4) are in 13.4 moles of methane gas?

$$\frac{13.4 \text{ mol CH}_4}{1} \left| \begin{array}{c} 16.042 \text{ g CH}_4 \\ 1 \text{ mol CH}_4 \end{array} \right| = \boxed{215 \text{ g CH}_4}$$

19. How many moles of aluminum iodide are present in 275 grams of aluminum iodide?

$$\frac{275 \text{ g AlI}_3}{1} \left| \begin{array}{c} 1 \text{ mol AlI}_3 \\ 147.68 \text{ g AlI}_3 \end{array} \right| = \boxed{1.86 \text{ mol AlI}_3}$$

20. How many grams of glucose ($C_6H_{12}O_6$) are in 0.141 moles of glucose?

$$\frac{0.141 \text{ mol C}_6\text{H}_{12}\text{O}_6}{1} \left| \begin{array}{c} 180.156 \text{ g C}_6\text{H}_{12}\text{O}_6 \\ 1 \text{ mol C}_6\text{H}_{12}\text{O}_6 \end{array} \right| = \boxed{25.4 \text{ g C}_6\text{H}_{12}\text{O}_6}$$