

Percent Composition Practice

Name/Period: Key

Guided Notes:

- Define percent composition.

% of each element in a compound

- What is the general equation used to solve for percent composition?

$$\% \text{ Comp} = \frac{\text{mass element}}{\text{mass compound}} \times 100$$

- What do the percentages of the elements in a compound need to add up to?

100

- Find the percent by mass of each element in NaNO₃ using the equation in #2. **SHOW YOUR WORK!!!**

$$\% \text{ Na} = \frac{22.98977}{84.99467} \times 100 = 27.0\% \text{ Na}$$

$$22.98977 + 14.0067 + 3(15.9994) = 84.99467$$

$$\% \text{ N} = \frac{14.0067}{84.99467} \times 100 = 16.5\% \text{ N}$$

$$\% \text{ O} = \frac{47.9982}{84.99467} \times 100 = 56.5\% \text{ O}$$

Complete the following percent composition practice problems. Show all of your work!

- Determine the percent composition of calcium in calcium chloride (CaCl₂).

$$\% \text{ Ca} = \frac{40.08}{40.08 + 2(35.453)} = \frac{40.08}{110.986} \times 100 = 36.1\% \text{ Ca}$$

- Calculate the percent composition of sodium sulfate (Na₂SO₄).

$$\% \text{ Na} = \frac{2(22.98977)}{2(22.98977) + 32.06 + 4(15.9994)} = \frac{45.97954}{142.03714} \times 100 = 32.4\% \text{ Na}$$

$$\% \text{ S} = \frac{32.06}{142.03714} \times 100 = 22.6\% \text{ S}$$

$$\% \text{ O} = \frac{63.9976}{142.03714} \times 100 = 45.1\% \text{ O}$$

- Which has the larger percent by mass of sulfur, H₂SO₃ or H₂S₂O₈?

$$\% \text{ S} = \frac{32.06}{2(1.00794) + 32.06 + 3(15.9994)} = \frac{32.06}{82.07408} \times 100 = 39.1\% \text{ S}$$

$$\% \text{ S} = \frac{2(32.06)}{2(1.00794) + 2(32.06) + 8(15.9994)} = \frac{64.12}{194.13108} \times 100 = 33.0\% \text{ S}$$

*H₂SO₃ has larger %S

- Which has the higher percent hydrogen-phosphoric acid (H₃PO₄) or hydrochloric acid (HCl)?

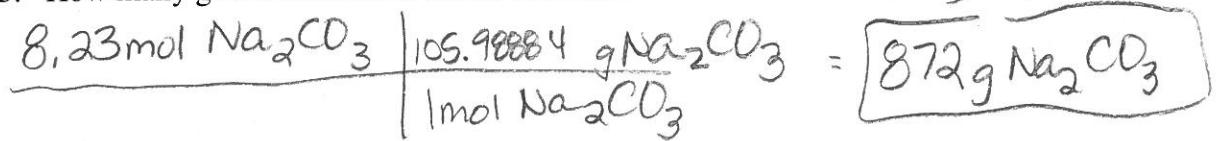
$$\% \text{ H} = \frac{1.00794}{31.00794 + 30.97376 + 4(15.9994)} = \frac{3.02382}{97.99518} \times 100 = 3.09\% \text{ H}$$

$$\% \text{ H} = \frac{1.00794}{36.46094} \times 100 = 2.76\% \text{ H}$$

(H₃PO₄)

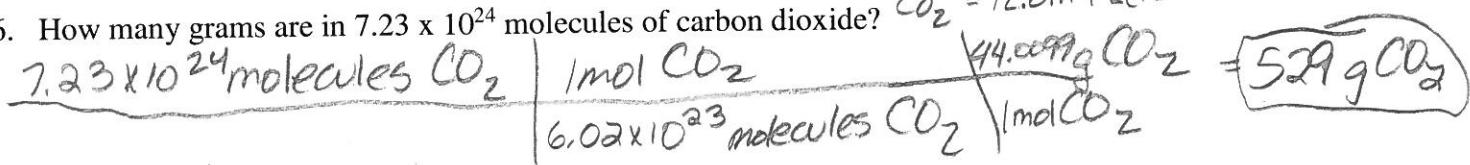
Mole Conversion Practice:

5. How many grams are in 8.23 moles of sodium carbonate?

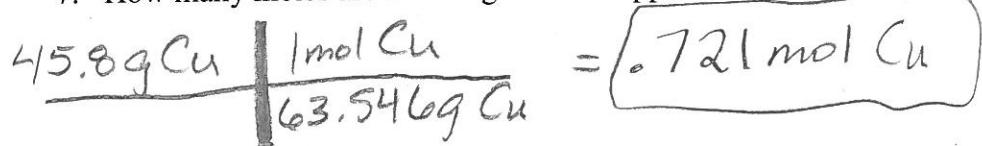


$$\text{Na}_2\text{CO}_3 = 2(22.98977) + 12.0111 + 3(15.9994) = 105.98884$$

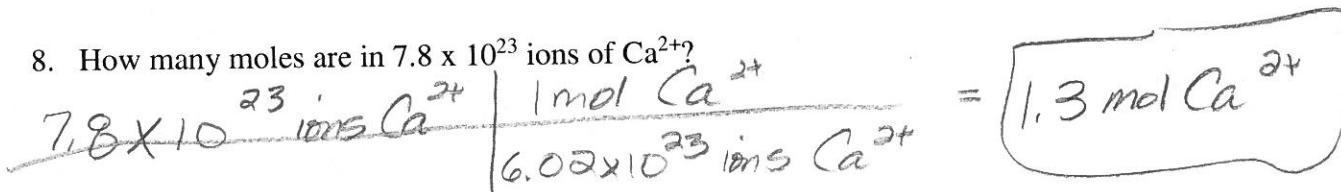
6. How many grams are in 7.23×10^{24} molecules of carbon dioxide?



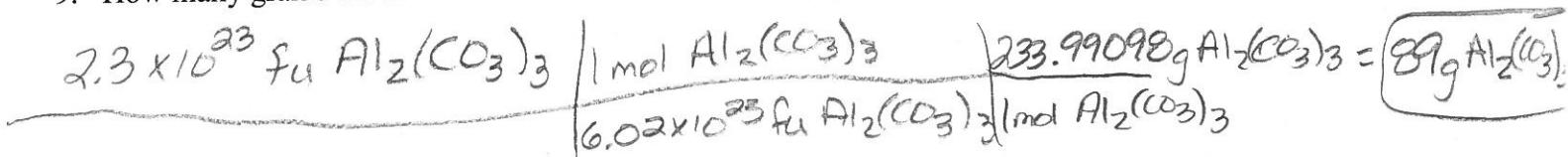
7. How many moles are in 45.8 grams of copper?



8. How many moles are in 7.8×10^{23} ions of Ca^{2+} ?



9. How many grams are in 2.3×10^{23} formula units of $\text{Al}_2(\text{CO}_3)_3$?



10. How many ions are in 50.1 grams of NH_4^+ ?

