

MASS, MOLES, AMOUNT, & PERCENT COMPOSITION

EVIDENCE NOTEBOOK

KEY IDEAS

1. Avogadro's number
 - a. Some words are used to represent an amount of something. Complete the examples below:

Terms (Research might be needed, but only the mole will be tested)	Value
Couple	2
Dozen	
Baker's dozen	
Century	
Grand	
Score	
Gross	
Mole	

- b. What are the units for atomic mass?

2. Moles and molecules. **How many atoms of carbon are in 7.34×10^{-3} moles of carbon?**
 - a. Step 1: What information is in the question?

 - b. Step 2: Formula or conversion needed:

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- c. Step 3: Solve: (include the units and cross-out units that are duplicated as numerators and denominators)
3. Converting amount to mass. **Determine the mass in grams of 5.50 mol of iron.**
- Use the periodic table to determine the atomic mass (molar mass) of iron.
 - Since we are given moles in the problem, _____ should be the denominator when solving this problem.
 - Solve: (include the units and cross-out units that are duplicated as numerators and denominators)
4. Converting mass to amount. **Determine the amount of moles in 32.4 grams of iron.**
- Use the periodic table to determine the atomic mass (molar mass) of iron.
 - Since we are given grams in the problem, _____ should be the denominator when solving this problem.
 - Solve: (include the units and cross-out units that are duplicated as numerators and denominators)

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5. Converting mass to amount. **Determine the amount of moles in 67.2 grams of iron (II) oxide.**

- a. Which (prior) evidence notebook explains how to determine the formula for ionic compounds?

- b. Review: Show to steps involved to determine the ionic formula for iron (II) oxide:

- c. Review: Show to steps involved to determine the ionic formula for iron (III) oxide:

- d. Determine the molar mass of iron (II) oxide by adding up all of the atoms in the compound:

- e. Since we are given grams in the problem, _____ should be the denominator when solving this problem.

- f. Solve: (include the units and cross-out units that are duplicated as numerators and denominators)

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6. Percent composition. **What would be the percent composition (by mass) of iron and oxygen in iron (II) oxide?**

a. Write the formula for determining the percent composition:

b. Write the molar mass of iron (II) oxide:

c. Write the molar mass of iron:

d. Solve for the percent composition of iron in iron (II) oxide:

e. Write the molar mass of oxygen:

f. Solve for the percent composition of oxygen in iron (II) oxide:

g. Double check: Sum the percentages of all your parts. If it rounds off to 100%, good job!

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CHECKPOINTS

Convert the following, showing your work and units!

1. 9.62 g CH_4 into moles.
2. 0.0431 mol of $NaOH$ into grams.
3. 45.9 mol $Mg(NO_3)_2$ into molecules.
4. 3.2×10^{40} molecules of copper (II) chloride into moles.
5. 3.56 grams of calcium nitride into molecules.

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6. What is the percent mass of hydrogen in water?

7. What is the percent mass of water in $ZnSO_4 \cdot 7H_2O$?