LESSON MAKER PRO

Compound Mass Lab

Calculate the mass of compounds made from two elements.

HIGH SCHOOL · PHS.3.5

PHS.3.5 "Use mathematical and computational analysis to determine the atomic mass of binary compounds."

NAME _____ DATE _____

COUNT EVERY ATOM

A binary compound contains two elements. To find its formula mass, multiply each element's atomic mass by the number of its atoms in the formula, then add the results. A missing subscript means one atom, and formula mass is measured in atomic mass units (u).

WORKED EXAMPLE

Find the formula mass of MgF_2. Mg = 24 u; F = 19 u.

1. Count the atoms: 1 Mg and 2 F.
2. Multiply: 1(24) = 24 u and 2(19) = 38 u.
3. Add: 24 + 38 = 62 u.

Answer: 62 u

PRACTICE 6 problems

1 Find the formula mass of CO. C = 12 u; O = 16 u.

ANSWER _____

2 Find the formula mass of NO_2. N = 14 u; O = 16 u.

ANSWER _____

3 Find the formula mass of CaS. Ca = 40 u; S = 32 u.

ANSWER _____

4 Find the formula mass of Fe_2O_3. Fe = 56 u; O = 16 u.

ANSWER _____

5 Find the formula mass of CH_4. C = 12 u; H = 1 u.

ANSWER _____

6 Find the formula mass of Na_2S. Na = 23 u; S = 32 u.

ANSWER _____

APPLY IT Show your work

1 Researchers are testing lithium-sulfur batteries. One compound that can form inside the battery is lithium sulfide, Li_2S. What is its formula mass? Li = 7 u; S = 32 u.

WORK SPACE

ANSWER _____

2 Silicon carbide, SiC, is used in some electric vehicle power electronics. What is its formula mass? Si = 28 u; C = 12 u.

WORK SPACE

ANSWER _____

CHALLENGE One step up

One formula unit of aluminum oxide, Al_2O_3, has a mass of 102 u. Oxygen has an atomic mass of 16 u. What is the atomic mass of aluminum? Show an equation that explains your answer.

WORK SPACE AND ANSWER

Compound Mass Lab

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the formula mass of CO. C = 12 u; O = 16 u.	**28 u**
2	Find the formula mass of NO_2. N = 14 u; O = 16 u.	**46 u**
3	Find the formula mass of CaS. Ca = 40 u; S = 32 u.	**72 u**
4	Find the formula mass of Fe_2O_3. Fe = 56 u; O = 16 u.	**160 u**
5	Find the formula mass of CH_4. C = 12 u; H = 1 u.	**16 u**
6	Find the formula mass of Na_2S. Na = 23 u; S = 32 u.	**78 u**

PART 2 · APPLY IT

1. **46 u** Two lithium atoms contribute 2(7) = 14 u, and one sulfur atom contributes 32 u. The total is 46 u.
2. **40 u** Add the mass of one silicon atom and one carbon atom: 28 + 12 = 40 u.

CHALLENGE

27 u; 2x + 3(16) = 102, so 2x = 54 and x = 27.

Accept equivalent addition or multiplication equations that count every atom. Formula masses are in u, not grams.