Percent Composition by Mass for Chemical Compounds.

The same percent composition formula that you use for mixtures can also be used for finding the composition of compound.

To find the percent mass of each element of the compound you should:

|  |  |
| --- | --- |
| Explanation | Example. What percent of vinegar (CH3COOH) is oxygen? |
| 1. Find the mass of the element that you are interested in by multiplying its average atomic mass by the number of them in the formula |  2 atoms of oxygen X 15.999 atomic mass 31.998 |
| 2. Find the mass of the entire compound by doing step one for each element and adding the answers together | Hydrogen: 1 x 1.008=4.032Carbon: 2 x 12.011=24.02231.998 +4.032+24.022=60.052 |
| 3. Put the answer from step one in the formula as the part and the answer for step 2 in the formula as the whole | Part / whole= % / 10031.998 / 60.052 = x / 100 |
| 4. Solve by cross multiplying | X = 53.28% oxygen |

Practice Problems (You can round to the nearest whole number for these.) Highlight under each question and change the font color to reveal the answer.

1. Mothballs keep insects away using an ingredient called Naphthalene (C10H8). What percent of Naphthalene is carbon?

120 amu carbon/128 amu total \* 100 = 94 %

2. Battery acid is often Sulfuric Acid H2SO4. What percent of sulfuric acid is sulfur?

32 amu/98 amu \*100= 33%

3. The chemical formula for white table sugar is C12H22O11. What percent of table sugar is oxygen?

176 amu / 342 amu \* 100 = 51%

4. Antifreeze is often made from ethyl glycol (HOCH2CH2OH). {hint: Written the way you are used to seeing them, this formula would be C2H6O2} What percent of ethyl glycol is hydrogen?

6 amu/ 62 amu \*100 = 10%