**Formula Mass**

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| **Student Objectives:** |
| * Use mass numbers from the periodic table to calculate the formula mass of any compound.
* Use a formula mass calculation to determine the percentage composition of a compound.
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**Formula Mass:**
**the sum of all the atomic masses in a formula.**

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|  | **To make these calculations easier, round all atomic mass numbers to the nearest whole number.**  |

**Sample Problem: calculate the formula mass of C2H5OH**

Use atomic mass from the Periodic Table.

Set up your calculation this way:

**element = (atomic mass) (# of atoms) =** u

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| C = 12 x 2 = 24H =   1 x 6 =   6O = 16 x 1 = 16**46** **u**  |  | **Your formula masscalculations shouldlook like this.** **Units must be included.**  |

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The units of formula mass are "atomic mass units" - u

A web-based **formula mass calculator**.



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| **Concept Understanding:** * Explain this statement: "Every molecular mass is a formula mass, but not every formula mass is a molecular mass".
* Work these formula mass **practice problems**. Remember that you must show how chemistry problems are set up and the units of the answer.

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**Percentage Composition:**
**the percentage of the formula mass represented by each element.**

**Percentage composition compares the mass of one part of a substance to the mass of the whole.**

**Calculating percentage composition:**

Do a formula mass calculation.
Divide the total atomic mass for each element by the total formula mass of the compound.

**Example:** Calculate the percentage composition of C2H5OH



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| The formula mass step | . | The percentage calculation step |  | **Your % compositioncalculations shouldlook like this.** |
| C   =  | 12 X 2 | = | 24 | . | 24 / 46 | =   52% Carbon |
| H   =  |   1 X 6 | = | 6 | . |   6 / 46 | =   13% Hydrogen |
| O   =  | 16 X 1 | = | 16 | . | 16 / 46 | =   35% Oxygen |
| . |      Total = 46 u | . | . |

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Because of rounding mass numbers to whole numbers, the total % could be between 99 and 101. If it is outside that range, you probably have a mistake.

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| **Concept Understanding:** * Work these percentage composition **practice problems**.

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**Research Links:**

* [**Percentage Composition Practice**](http://dbhs.wvusd.k12.ca.us/Stoichiometry/Percent-Composition-Part1.html) **- Diamond Bar High School**