



Percent Composition by Mass

Video Workbook with Dr. B

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Different elements have different masses. Therefore it is useful to know how each contributes to the overall mass of a compound.

$$\text{Percent Composition} = \frac{\text{Molar Mass of Element} \times \text{Number of that Element}}{\text{Molar Mass of Compound}} \times 100$$

Example: what is the percent composition by mass of each element in H₂O?

$$H = \frac{1.01 \times 2}{18.02} \times 100 = 11.2\%$$

$$O = \frac{16.00 \times 1}{18.02} \times 100 = 88.8\%$$

1.01g/mol is the Molar Mass of H
There are 2 H atoms in H₂O
18.02g/mol is the Molar Mass of H₂O

16.00g/mol is the Molar Mass of O
There is 1 O atom in H₂O
18.02g/mol is the Molar Mass of H₂O

For example, for H₂O, Hydrogen makes up 11.2% of the mass of the compound. Oxygen makes up 88.8%. This is because H atoms are much lighter than O atoms.

Watch this video for all you need to learn how to find percent composition!

[How to Find Percent Composition for a Compound](#)

Practice with Video Explanations

Easy



<https://youtu.be/XqaWvOwGXsE>

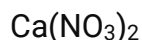


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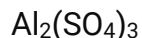


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Medium



<https://youtu.be/UrYTMemzCvI>

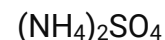


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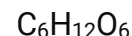


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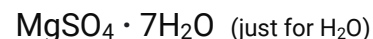
More Challenging



<https://youtu.be/OMhhDdysbDU>



<https://youtu.be/UilDN0k3Oos>



<https://youtu.be/DU36vqVFNgM>

Answers Below (Note, depending how you round you may get a slightly different answer.)



H_2O_2 : H = 5.94%, O = 94.06% NaN_3 : Na=27.1%, N=16.5%, O=56.5% NaOH : Na=58.5%, O=40.0%, H=2.5%	$\text{Ca}(\text{NO}_3)_2$: Ca=24.4%, N=17.1%, O=58.5% $\text{Al}_2(\text{SO}_4)_3$: Al=15.8%, S=28.1%, O=56.1% H_2SO_4 : H=2.1%, S=32.7%, O=65.3%	$(\text{NH}_4)_2\text{SO}_4$: N=21.2%, H=6.1%, S=24.3%, O=48.4% $\text{C}_6\text{H}_{12}\text{O}_6$: C=40.0%, H=6.7%, O=53.3% $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$: % Comp for H_2O = 51.2%
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Report errors and suggestions to DrB@breslyn.org



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