

Balancing Chemical Equations

Learning Target: I can balance chemical equations.

Introduction

The Law of Conservation of Matter states that matter cannot be created nor destroyed. The way this applies to chemical equations is that the amount of **atoms** does not change in a reaction. In chemistry, we don't count the actual number of atoms in a reaction, we find the ratio of each element. In other words, we know how many molecules of one substance in the reaction compared to one molecule of another substance.

Steps for Balancing a Chemical Equation

<ol style="list-style-type: none"> 1. Write the unbalanced equation with enough space underneath to work the problem. 2. Below each side, list the elements, in same order. 3. Write the count of each element. If sides are balanced, you are done! 4. Decide which element to balance first (if an element is present by itself, save that for last) 5. Remember, you can NOT change the subscripts (why?). Instead, <ol style="list-style-type: none"> a. change the coefficient of the molecule. b. Calculate the new count of elements in that molecule. c. For example, $2\text{H}_2\text{O}$ has 4, H's (2×2), and 2, O's (2×1). d. Update the count of the affected atoms. Example: 6. Once that element is balanced, go on to the next unbalanced element. Remember, you may have 'unbalanced' one element as you balanced another, that's OK. 7. When all the elements are balanced, check your work. Double check that everything is balanced and make sure your coefficients are written in the lowest-possible ratio. For example, if all the coefficients are divisible by 2, they aren't in the lowest possible ratio. 	<p>Example here:</p>
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