

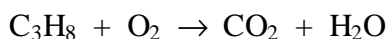
4 • Chemical Equations and Stoichiometry

COMBUSTION EQUATIONS

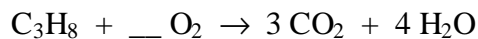
For burning to occur, you need a fuel, an oxidizer, and heat. When hydrocarbons are the fuel and O₂ in the air is the oxidizer, then CO₂ and H₂O are the products.

Example: Write the balanced equation for the complete combustion of propane, C₃H₈, in air.

Solution: First, set up the basic equation. You memorize the “+ O₂ → CO₂ + H₂O” part.



Next, balance. 3 C's in C₃H₈ result in 3CO₂'s; 8 H's in C₃H₈ result in 4 H₂O's;



Total O's on the product side = 10 [(3 x 2) + (4 x 1)] = total O's on the reactant side.

This would mean that 5 O₂'s were involved.

Tip: If an UNEVEN number of O's need to be represented, a fraction should be used. 7 O's = $\frac{7}{2}$ O₂

Tip: Take into account fuels that contain oxygen. Subtract the O's from that represented as O₂'s

Practice: Write the balanced combustion equations for the following substances.

1. CH₄
2. C₅H₁₂
3. C₉H₂₀
4. C₂H₆
5. C₈H₁₈
6. C₄H₁₀
7. C₂H₅OH
8. C₃H₇OH
9. HC₂H₃O₂
10. CH₃COCH₃