

Limiting Reactants

10th Grade

Which ingredient runs out first, and why that decides the yield.

A reaction stops when one reactant is used up, however much of the other remains.

1 BALANCE THE EQUATION

The coefficients give the required mole ratio.

2 CONVERT BOTH TO MOLES

Mass divided by molar mass.

3 COMPARE WITH THE RATIO

Which reactant provides fewer 'sets' of the ratio?

4 USE THE LIMITING ONE

Calculate the product from that reactant only.

THE SANDWICH ANALOGY

2 slices of bread + 1 filling = 1 sandwich

10 slices and 8 fillings → only 5 sandwiches. Bread limits.

Percent yield = $\text{actual} \div \text{theoretical} \times 100$. It is never above 100% in a correct experiment.