

ARIS.

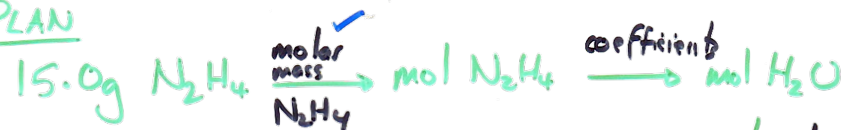
ex: Given the unbalanced equation:



then calculate how many grams of H₂O can be formed from 15.0g N₂H₄?



PLAN



$$2 \times \text{N} = 2 \times 14.01$$

$$4 \times \text{H} = 4 \times 1.008$$

$$\underline{\underline{32.04}}$$



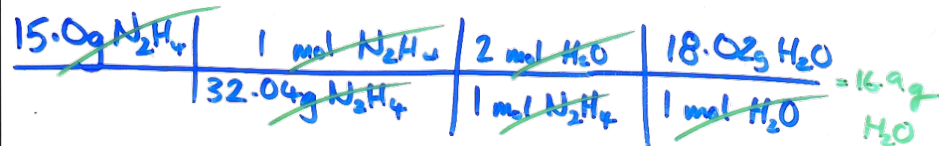
$$2 \times \text{H} = 2 \times 1.008$$

$$1 \times \text{O} = 1 \times 16.00$$

$$\underline{\underline{18.02}}$$

9 H₂O

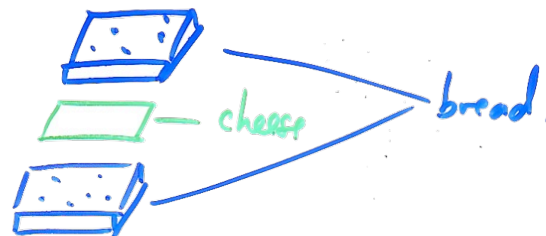
molar mass H₂O



3.9 Limiting Reagents

8 sl bread + 7 sl. cheese = ? cheese SW

4 SW



$$\frac{8 \text{ sl bread} \mid 1 \text{ SW}}{2 \text{ sl. bread}} = 4 \text{ SW}$$

Limiting Reagent (LR) if all bread is used up.

$$\frac{7 \text{ sl cheese} \mid 1 \text{ SW}}{1 \text{ sl. cheese}} = 7 \text{ SW}$$

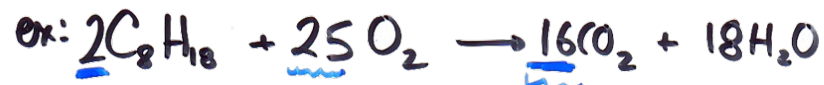
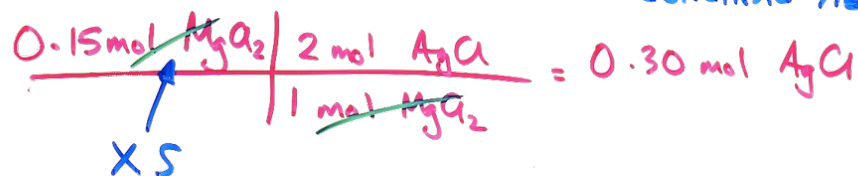
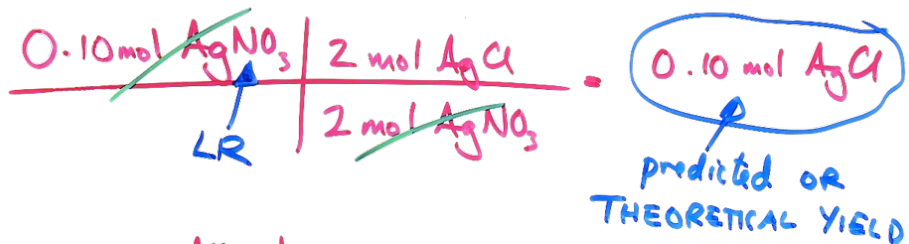
Excess Reagent XS if all cheese is used up.

smaller

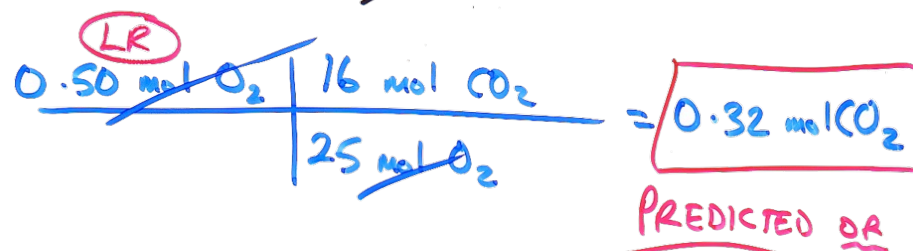
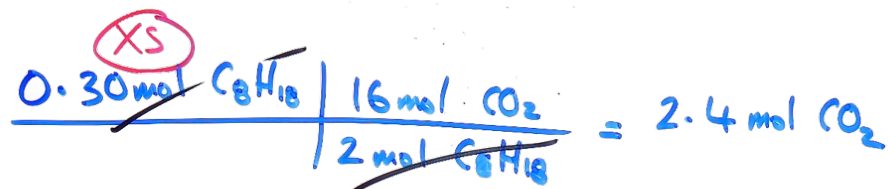
ex:



ex: if 0.10 mol AgNO_3 and 0.15 mol MgCl_2 react, then how many mol of AgCl will be made?



Q. How many mol CO_2 can be formed from 0.30 mol C_8H_{18} and 0.50 mol O_2 ?



3.10 Reaction Yield

$$\% \text{ Yield} = \frac{\text{Actual Yield (exp.)} \times 100}{\text{Theoretical Yield (calc.)}}$$

experimental
calculated

ex: If we only made 0.14 mol CO_2 in last rxn, our % yield = $\frac{0.14}{0.32} \times 100 = 44\%$

reaction

Ch 4 Rxns in aqueous solns
reactions solutions

Aqueous solution: Something is dissolved in water.

Solution: Small amount of something **SOLUTE** DISSOLVED IN a Larger Amount of something **SOLVENT**

ex: Brine: **NaCl** in **H₂O**
aqueous solute solvent

ex: Benzene in Gasoline
solute solvent

ex: **O₂(g)** in **N₂(g)** **AIR**
solute solvent

21% O₂, 78% N₂, 1% Ar

ex: Alloys (solid soln)

ex: White Gold: Pt in Au

SOLUTE

↓
Dissolve in H₂O
+ form solns that conduct elec.

ex: NaCl
KNO₃
(often ionic cpds)

ELECTROLYTES

↘
Dissolve in H₂O
+ form solns that do not conduct elec.

ex: C₆H₁₂O₆ glucose
C₂H₆O ethanol
(often molecular cpds)

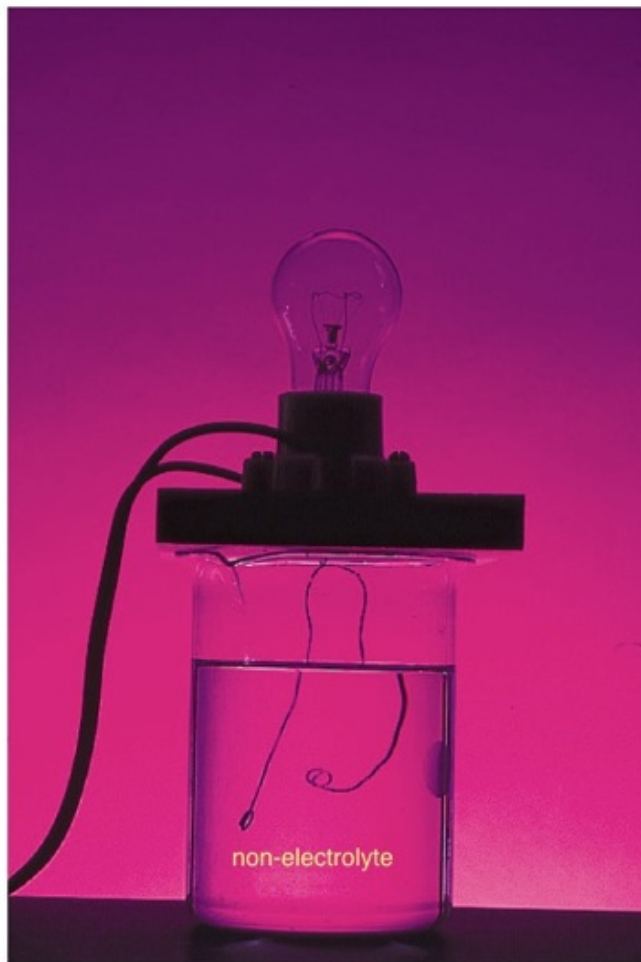
NON-ELECTROLYTES

also... weak-electrolytes

- dissolve in H₂O
- only conduct weakly!

ex: CH₃COOH acetic acid
(vinegar)

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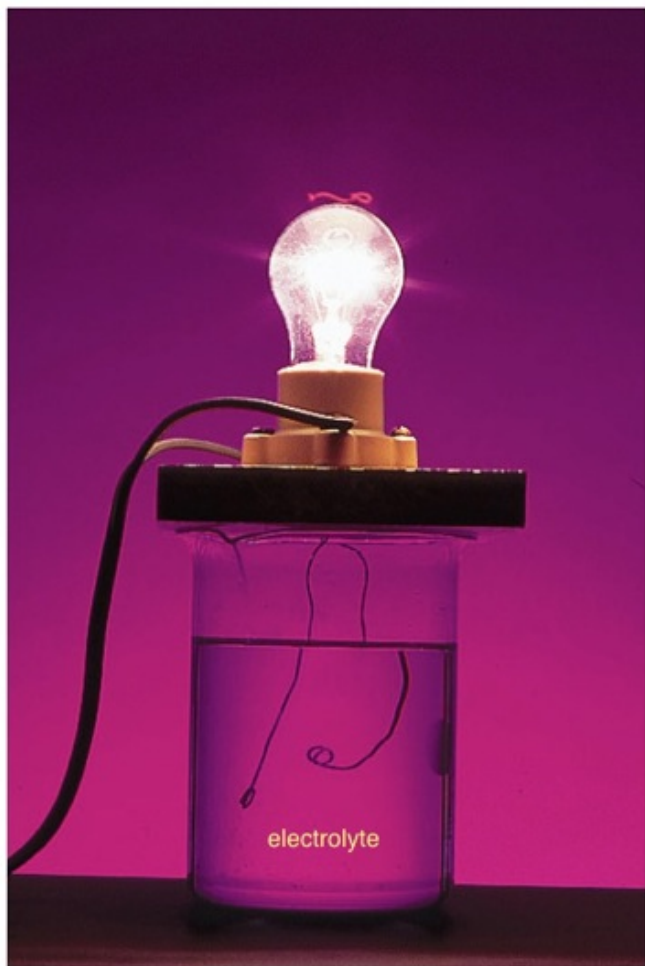


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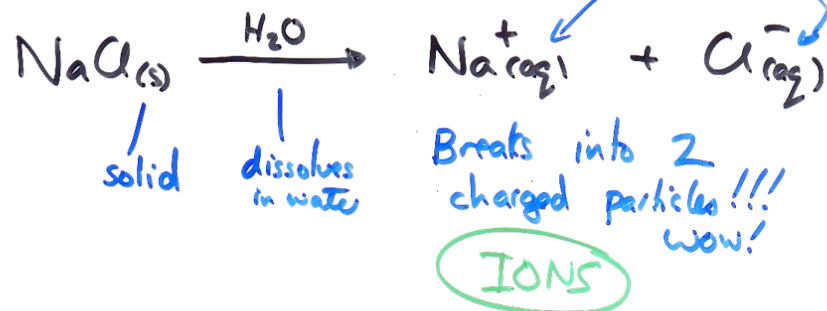
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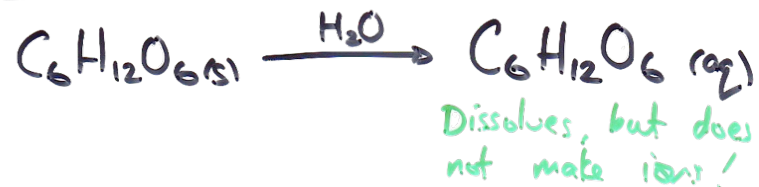
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WHY?

Electrolytes



Non-Electrolytes



Weak Electrolytes

