

Unit 1

Ionic Reactions and Net Ionic Equations

SOURCE LOCK

Built from SCH3U video-distilled notes, video range P7-P13, 7 lessons. No outside textbook text added.

Big idea

- A net ionic equation shows the particles that actually change during a reaction.

Lesson map

- P7 Electrolytes and Ionization Equations (1h 0m)
- P8 Ionic Reactions and Net Ionic Equations (45m 28s)
- P9 Ion Coexistence and Ion Tests (56m 37s)
- P10 Conductivity of Electrolytes (15m 13s)
- P11 Net Ionic Equations with Quantity Conditions (18m 39s)
- P12 Checking Net Ionic Equations (23m 32s)
- P13 Net Ionic Equation Review (32m 49s)

Core Notes

What to know

- Separate a reaction into the complete molecular equation, the complete ionic equation, and the net ionic equation.
- Split only substances that are both soluble in water and strongly ionized in solution.
- Keep precipitates, gases, water, weak electrolytes, and context-dependent solids in formula form.
- Cancel spectator ions only after both sides have been written in ionic form.
- Check both atoms and total charge at the end.

Problem-solving workflow

- Write the balanced molecular equation.
- Decide what can split into free ions in water.
- Write the complete ionic equation.
- Cancel spectator ions.
- Check atom balance and charge balance.

Common traps

- Do not split a substance just because it is an electrolyte in another context.
- Concentrated sulfuric acid is treated differently from dilute sulfuric acid in the source videos.
- For slightly soluble hydroxides, pay attention to whether the problem says clear solution, suspension, product, or reactant.
- A physical ionization equation is not the same thing as a chemical net ionic equation.

Teacher Moves

WHY THESE MATTER

These are the teacher-style moves distilled from the video notes: how to decide, not just what to memorize.

Move 1

- Look for the particles that actually react; those become the net ionic equation. | Source: P7 00:32:09, P8 00:33:24, P12 00:07:12.

Move 2

- Cancel spectator ions only after writing the complete ionic equation. | Source: P8 00:05:52, P13 00:26:10.

Move 3

- Decide splitting from the actual aqueous context, not from habit. | Source: P8 00:17:17, P13 00:09:06.

Move 4

- For slightly soluble substances, use the problem wording to decide whether to split. | Source: P11 00:17:55, P12 00:22:43.

Move 5

- Treat concentrated sulfuric acid as a special case; do not split it like dilute strong acid. | Source: P8 00:17:36.

Worked Example Cards

video-pattern example

Net ionic equation: silver nitrate + sodium chloride

Source: Unit 1 distilled workflow, P7-P13

1. Molecular: $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$.
2. Split only aqueous strong electrolytes: $\text{Ag}^+ + \text{NO}_3^- + \text{Na}^+ + \text{Cl}^- \rightarrow \text{AgCl}(\text{s}) + \text{Na}^+ + \text{NO}_3^-$.
3. Cancel spectator ions Na^+ and NO_3^- .
4. Net ionic: $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$.

Answer: $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$

video-pattern example

Neutralization: acid + hydroxide

Source: Unit 1 teacher move: split from context

1. For a strong acid and soluble hydroxide, split the aqueous ions.
2. H^+ and OH^- are the changing particles.
3. Spectator ions stay unchanged and cancel.
4. Net ionic: $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$.

Answer: $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$

Practice prompts

- Convert a neutralization reaction into a net ionic equation.
- Identify spectator ions in a precipitation reaction.
- Explain why an insoluble solid is not split into ions.